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**Decennial Census
Data for Selected
Health Occupations**
United States, 1980

Data From the National Health Survey
Series 14, No. 31

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Decennial Census Data for Selected Health Occupations United States, 1980

Information is presented on the geographic distribution and supply, and the gender and race/ethnicity of 24 categories of health occupations from the 1980 decennial census. This report also presents a summary of a comparative analysis of the census and other health manpower sources funded by the Bureau of Health Professions.

**Data From the National Health
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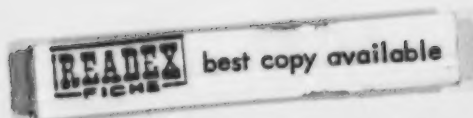
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This report's evaluation of the utility of the 1980 decennial census health occupation data for researchers and analysts is based upon a comprehensive study conducted by the American Institutes for Research (AIR). The AIR study was funded and directed by the Bureau of Health Professions, Public Health Service. Those readers interested in detailed information on the AIR study should consult its final report, which is available from the National Technical Information Service (NTIS). The NTIS address is 5285 Port Royal Road, Springfield, Virginia 22161.



Contents

Introduction	1
Related reports previously published	2
Overview of decennial census data	3
Sex of civilian personnel in health occupations	3
Race and ethnicity of civilian personnel in health occupations	4
Comparison of census counts and data from other sources	5
Methodology	5
Comparison results	5
Conclusions and recommendations	14
References	16
List of detailed tables	17
 Appendixes	
I. Methodology and definitions employed in the 1980 decennial census	45
II. American Institute for Research comparisons of census and noncensus counts	49
III. Qualifications of the data	51
 List of text tables	
A. Number and percent distribution of persons employed in health occupations by major occupation groups: United States, 1980	3
B. Percent of females employed in selected health occupations: United States, 1970 and 1980	3
C. Agreement between health occupations supply estimates based on 1980 decennial census and other sources	14

Symbols

- Data not available
 - ... Category not applicable
 - Quantity zero
 - 0.0 Quantity more than zero but less than 0.05
 - Z Quantity more than zero but less than 500 where numbers are rounded to thousands
 - * Figure does not meet standard of reliability or precision
 - # Figure suppressed to comply with confidentiality requirements
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Decennial Census Data for Selected Health Occupations

by G. Gloria Kapantais, Office of Vital and Health Care Statistics

Introduction

This report, based on information collected during the 1980 decennial census, presents data for personnel employed in 24 health occupational categories. All data derived from the 1980 decennial census are as of the reference date of the 1980 census, April 1980. Various demographic characteristics of persons employed in health occupations are presented. These characteristics include sex, race, Hispanic heritage, and residence. Data are presented for the Nation and for each State.

These data were compiled from the response to the questions on the long-form questionnaire given to approximately 20 percent of all U.S. households in the 1980 decennial census.¹ The particular data file used was the 1980 census/Equal Employment Opportunity (EEO) Special File produced by the U.S. Bureau of the Census. This file does not provide individual person data but does provide full sample estimates of the

experienced labor force for each occupational category counted by the 1980 census. (The experienced labor force includes employed persons and those unemployed but seeking work and available for work.) Refer to appendix I for a description of the methodology and definitions employed in the 1980 decennial census.

In addition to summarizing the health occupation data of the 1980 decennial census for the Nation and for individual States, this report also summarizes the findings of a study of these census data by the American Institutes for Research (AIR) funded and directed by the Bureau of Health Professions, Public Health Service.² (See appendix II.) The purpose of this study was to compare the census health occupation data with data from other private and government studies in an effort to determine its utility and reliability for health manpower analysts.

Related reports previously published

Previous compilations of similar data obtained during the 1950, 1960, and 1970 decennial censuses have been published by the Public Health Service.³⁻⁵ The 1950 and 1960 reports contain data on persons employed in 18 health occupations for the United States as a whole and for each State of residence, and provide a brief comparison of data from other sources. The 1970 report presents demographic data on persons employed in 28 selected health occupations and compares the census data with comparable data obtained by the National Center for Health Statistics and other sources.

Overview of decennial census data

The U.S. Bureau of the Census used 503 specific categories of occupations to describe the work force of the United States in 1980. Of the 503 categories, 24 are generally considered to be health occupations. The total number of persons in the health occupations was 5.2 million, or 5 percent of the 104.4 million persons in the civilian labor force during the 1980 Census of Population. (This does not include those persons working in the health industry as secretaries, engineers, and so forth.) The number of persons in each of these health occupations by major occupation group is shown in table A.

Table A. Number and percent distribution of persons employed in health occupations by major occupation groups: United States, 1980

Occupation	Number	Percent distribution
Total	5,187,033	100.0
Health diagnosing occupations.....	646,826	12.5
Physicians.....	433,255	8.4
Dentists.....	125,291	2.4
Veterinarians.....	34,355	0.7
Optometrists.....	24,605	0.5
Podiatrists.....	7,781	0.2
Health diagnosing practitioners, n.e.c.....	21,539	0.4
Health assessment and treating occupations.....	1,722,576	33.2
Registered nurses.....	1,285,299	24.8
Pharmacists.....	145,637	2.8
Dietitians.....	67,270	1.3
Therapists.....	193,933	3.7
Inhalation therapists.....	48,738	0.9
Occupational therapists.....	17,756	0.3
Physical therapists.....	43,075	0.8
Speech therapists.....	41,296	0.8
Therapists, n.e.c.....	43,068	0.8
Physician assistants.....	30,437	0.6
Technicians and related support occupations.....	989,347	19.1
Clinical laboratory technologists and technicians.....	243,982	4.7
Dental hygienists.....	46,192	0.9
Health record technologists and technicians.....	15,147	0.3
Radiologic technicians.....	96,311	1.9
Licensed practical nurses.....	435,176	8.4
Health technologists and technicians, n.e.c.....	152,539	2.9
Health service occupations.....	1,828,284	35.2
Dental assistants.....	158,117	3.0
Health aides, except nursing.....	292,049	5.6
Nursing aides, orderlies, and attendants.....	1,376,118	26.6

NOTE: n.e.c. = not elsewhere classified.

The 24 health occupations are classified into four major categories by the U.S. Bureau of the Census. The first group (health diagnosing occupations) contains the smallest number of persons. Two occupational categories constitute about two-thirds of the health occupational work force; these two groups include registered nurses and nursing aides, orderlies, and attendants. Each of these occupations has over 1 million practitioners.

Analyses of the 1980 census data for persons in 24 health occupational categories by sex and race/Hispanic origin are contained in the following sections of this report.

Sex of civilian personnel in health occupations

In 1980, almost 4 million females were in the 24 health occupational categories; this represented 77 percent of all persons in these occupations (table 1). The majority of these females was concentrated in three occupations: 31 percent were registered nurses; 30 percent were nursing aides, orderlies, and attendants; and 10 percent were practical nurses.

Practitioners in the health diagnosing occupations who are involved in patient care have traditionally been predominately male. Although this is still true, women have substantially increased their number in these occupations in the 10 years since the 1970 decennial census. For one occupation (veterinarians), the percent of female practitioners more than doubled, and for three other occupations (dentists, optometrists, and pharmacists) the percent of female practitioners doubled from 1970 to 1980 (table B).

Women continued to dominate nursing and most of the other health occupations, with the percent of female practitioners ranging from 56 percent of inhalation therapists to 98 percent of dental hygienists (table 1).

Table B. Percent of females in selected health occupations: United States, 1970 and 1980

Occupation	Females	
	1970	1980 ¹
	Percent	
Dentist.....	3	7
Optometrist.....	4	8
Pharmacist.....	12	24
Physician.....	9	13
Podiatrist.....	8	8
Veterinarian.....	5	13

¹These percents are based on numbers presented in table 1.

Race and ethnicity of civilian personnel in health occupations

Persons of minority races constituted 21.3 percent of all persons in these 24 health occupations in 1980. Black persons were the largest minority (13.9 percent), followed by Hispanic persons (3.8 percent), Asian and Pacific Islanders (3.0 percent), and Native Americans (0.5 percent). (See table 2.)

Nursing occupations include about three-fourths of all the black persons who are in these 24 health fields. Fifty-two percent are nursing aides, orderlies, and attendants; 13 percent are registered nurses; and 11 percent are licensed practical nurses.

Over half of the Hispanic persons are also concentrated in the nursing profession, with 36 percent employed as nursing aides, orderlies, and attendants; 14 percent as registered nurses; and 8 percent as licensed practical nurses. In addition, about 10 percent of the Hispanic persons in health occupations are physicians. (Persons of Hispanic origin or descent are those who classified themselves in one of the specific Spanish origin categories listed in the decennial census questionnaire as well as those who indicated that they were of other Hispanic origin.)

Native Americans follow the same trend as described for black persons and Hispanic persons, and are concentrated in the nursing profession. Almost half (45.4 percent) are nursing aides, orderlies, and assistants, while 15.0 percent are registered nurses and 10.8 percent are licensed practical nurses.

About one-fourth (26.8 percent) of all the Asian and Pacific Islanders in these health occupations are physicians. This is the largest percent within any racial group including white persons. Another fourth (27.4 percent) are registered nurses. Only 12.6 percent are nursing aides, orderlies, and attendants. This is the lowest percent for any of the minorities.

The distribution pattern in the health care field for non-Hispanic white persons is similar to that for minorities in that the nursing profession is the predominant area. Twenty-seven percent are registered nurses; 22 percent are nursing aides, orderlies, and attendants; and 8 percent are licensed practical nurses. After nursing, the next most frequent health profession for non-Hispanic white persons is that of physicians (9 percent).

Tables 3-26 are State tables that give the place of residence, race, and sex for persons in each of these 24 health occupations. These tables should be used with caution, for the following reasons: Most of these 24 health occupations are small in total number of practitioners; only 2 (registered nurses and nursing aides, orderlies, and attendants) have more than 1 million practitioners; 14 have less than 100,000 practitioners. Given these small populations, and the presentation of data by racial and sex subgroups, the sampling errors tend to be large. Appendix III contains a detailed description of the limitations of these data.

Comparison of census counts and data from other sources

The American Institutes for Research (AIR), under contract to the Bureau of Health Professions (BHPr) of the Public Health Service, has conducted an indepth examination of the census health occupation data and compared the data with that from other data sources in an effort to determine the feasibility of using the census data to generate health manpower estimates. The comparisons presented in the following pages are based on the findings of that study.⁴

Methodology

Screening criteria were applied by AIR to the census data in an effort to further clean the data and to create more refined occupational groupings. In most cases the screening criteria consisted of a minimum level of education, or a minimum level of education by age only. For a few occupations, industry could also be used to screen out people who were classified with health personnel because of similar job functions, but who were not working in health care settings. Respondent, coder, and processing errors in the census data combined to permit the inclusion of persons who, by virtue of their stated education, could not be working in the stated occupation. These were removed via the screening criteria. In other cases the intent of the census was to include a range of personnel performing similar job functions, not all of whom would necessarily have equivalent qualifications by the standards of the profession. Here AIR screening criteria did not remove anyone, but was used to subdivide the occupation into these different levels of qualification for analysis. Finally, in the case of more heterogeneous professions, where no firm educational screening criteria could be identified, education was, nevertheless, cross-tabulated with most other variables to possibly reveal more homogeneous subgroups.

When the two variables (education and occupation) disagreed, the AIR screening process assumed that potential for error was greater for the occupation variable because of the definitional complexities involved and because of the extra coding step that was required to place this information on the census file. No other variable was readily available to help determine by triangulation whether education or occupation was more likely correct. Therefore, for those occupations in which minimum education criteria existed that could be used in screening, AIR staff held detailed conversations with members of the relevant professional associations to insure that the most appropriate criteria were selected.

AIR staff analyzed cases that failed a screening criterion

to determine how they differed from other cases in the same occupation that passed the criterion. In a few instances, analyses were performed to compare cases failing the screening criterion for one occupation with some other specific occupation to which these respondents might belong.

The majority of the analyses, however, were conducted for cases passing the screening criteria, or when no screening criterion was applicable, for cases subdivided by levels of education. For each occupation, population estimates and percents were calculated for labor force status and, among those who were employed, for age, sex, race/ethnic origin, education, citizenship, location by State and by urban or rural area type, class of worker, industry, and income.

The population estimates resulting from these analyses were compared, where possible, with similar population estimates derived from noncensus data sources. The first step in this comparison analysis was for AIR staff to determine the nature and extent of the data sources that could provide independent estimates of the supply of health professionals in one or more of the selected occupations. To do this, a number of primary and secondary source documents were reviewed and then personal or telephone interviews were conducted with appropriate personnel at most of the professional associations and government agencies concerned with the supply of health professionals. As a result of the discussions and document reviews, three major categories of external data sources were identified with which census counts of health professionals could be compared. These included health profession association inventories, employment surveys, and subnational data sources. A detailed description of these three sources and the procedure employed for comparing the independent data with the census data is contained in appendix II.

The results of the comparisons and a discussion of the probable causes of observed discrepancies are included in the section of this report entitled "Conclusions and recommendations."

Comparison results

Physicians

The estimated number of active civilian physicians in 1980, based upon the census occupational category, was 408,290. Note that this number does not agree with the Equal Employment Opportunity (EEO) Special File estimate given in the detailed tables in this report because AIR screened for a min-

imum education level of 6 years of college, which eliminated those persons having less than this amount of education. In addition, they used the 5-percent Public Use Microdata Sample A (PUMSA) file from the census. This is a self-weighted file that contains person-level data and some sociographic and demographic characteristics. This number (408,290) represents about 95 percent of the 430,157 active civilian physicians estimated from the files of the American Medical Association (AMA) and the American Osteopathic Association (AOA). (The standard error equals 3,342, hence the 95-percent confidence interval ranges from approximately 402,000 to 415,000, and the difference is outside the 95-percent confidence level for the census estimate.)

According to AIR analysis of independent data sources, the AMA Physician Masterfile data and the AOA data are the best noncensus data sources for physicians.

The census figure does not include those physicians who were medical directors, medical scientists, or health care administrators. These were counted in other health occupation categories (medical science teachers, medical scientists, and medicine and health managers. Unfortunately, there is no way to separate the physicians from all the other types of doctoral- and master's-level persons included in these three categories.

One other problem exists with the census figure. According to the AMA and AOA estimates, there are 392,602 physicians engaged primarily in patient care. This is substantially less than the 408,290 counted by the census. Therefore, it would appear that some of the physicians who are primarily in teaching, administration, or research have reported their occupation to the census in such a way that they were simply classified as physicians rather than as being in these other occupational categories.

The AIR analysis of the screened PUMSA file yielded a distribution of 88 percent male physicians and 12 percent female physicians. This compares closely with the distribution shown in table 1 of this report, where 87 percent are male physicians and 13 percent are female. However, according to AMA figures, females constituted only 10 percent of all active physicians as of December 1979.

There is also a close correspondence in the percent distribution by race and ethnic origin of physicians between the census EEO file and the screened PUMSA file. The largest difference is in the Asian and Pacific Islander category, 10.6 percent of physicians on the PUMSA file, and 9.7 percent on the EEO file. Unfortunately, similar data from other noncensus sources are not available.

The State distribution of physicians shown in table 3 compares closely with the State distribution from the PUMSA file. The largest difference is for the State of Florida: 4.5 percent on the EEO file and 3.9 percent on the PUMSA file. The percents for physicians by State are also very similar between census and noncensus files. The differences are generally no more than 0.1 percent and within one standard error of the census population. The most noticeable difference between these estimates occur in Washington, D.C. (0.4 percent in the census files and 0.8 percent in the AMA and AOA files).

Location on the census files is defined by residence and thus varies from practice location, particularly when location is

examined for geographic units smaller than whole States. This may be the reason for some of the discrepancy noted for physicians in the District of Columbia.

Dentists

A screening requirement of at least 5 years of college was applied by AIR to the dentists on the PUMSA file. This eliminated 9,139 persons, resulting in an estimate of 118,082 active, civilian dentists in 1980. (Due to the use of a different data file and the screening criteria, this total differs from that in the detailed tables in this report.)

The AIR analysis of noncensus data sources determined that the best "other" estimate of the number of civilian dentists in 1980 is from the Division of Dentistry of the BHP. That estimate (118,330) is close to the PUMSA estimate of 118,082. The difference is approximately one-tenth of one standard error from the census estimate. (The standard error for the census estimate is 1,797.)

The distribution of dentists by sex and race and ethnic origin in the two census files is quite similar. The EEO file has 93.3 percent male dentists and 6.7 percent female, however, the PUMSA file has 97.3 male dentists and 2.7 percent female. The main dissimilarities between the two files for race and ethnic origin occur among Asian and Pacific Islanders (2.5 percent PUMSA versus 3.1 percent EEO file) and other (0.1 percent PUMSA versus 0.05 percent EEO file).

A comparison of these characteristics of dentists with noncensus sources required the use of another file—the 1978–79 American Dental Association (ADA) total population postcard survey.

The ADA figure for female dentists was only 1.6 percent for 1968. One explanation for some of the difference with the census estimates may be a reflection of the increasing enrollment of women in dental schools. Therefore, the 1978 figure may be behind the 1980 figure in estimating female representation in this profession.

State distribution of dentists among the three data files are similar. The largest difference between the two census files was 0.6 percent in Michigan. Between the PUMSA file and 1979 ADA data, there was also close agreement in the percent distribution by State, with the largest difference again occurring in Michigan (0.8 percent).

The AIR analysis of the census health occupation data concluded that the dentist data was "an accurate reflection of the profession and can be used with confidence. . . ."²

Optometrists

Education by age screening criteria was applied by AIR to the optometrists on the PUMSA file. These criteria take into account the evolution that has occurred in optometric education and was as follows:

- For those 45 years of age and under, at least 6 years of college education
- For those 46–51 years of age, at least 5 years of college education.
- For those 52–66 years of age, at least 4 years of college education.

- For those 67-74 years of age, at least 3 years of college education.
- For those 75 years of age and over, any amount of education.

Application of these criteria resulted in the exclusion of 14.4 percent of the cases. The optometrist estimate for 1980 was then 22,653 using the PUMSA file.

Based on the AIR analysis, the best noncensus estimate for active civilian optometrists is derived from BHP estimates (21,342). After screening for minimum education, the estimate is 21,707, which has a standard error of 771. The two estimates are, therefore, in very close agreement.

The racial and ethnic distribution of optometrists between the census EEO and PUMSA files is similar. Both indicate that non-Hispanic white optometrists are the vast majority (95.4 percent on the PUMSA and 94.7 percent on the EEO files). Both files indicate that, among minorities, the largest group is the Asian and Pacific Islanders (2.2 percent versus 2.3 percent).

Regarding the sex distribution of optometrists, the EEO file indicates that 8.3 percent are female while the PUMSA file has only 3.8 percent female.

A comparison of the racial and sex characteristics of optometrists with the BHP estimate indicates that females comprise slightly less than 6 percent of optometrists in the noncensus data source. Minorities comprise 3.5 percent of the total number of optometrists in the BHP estimate, and 60 percent of these were of either Japanese or Chinese origin.

Comparison of the State distribution estimated by the two census files and a noncensus source shows close agreement. As 1978 estimates from the American Optometric Association were used, this 2-year difference must be noted when comparing the percents. The largest difference was for Illinois, which ranged from 6.1 percent in the EEO file to 8.1 percent from the 1978 American Optometric Association estimate.

Pharmacists

Due to changes in the length of the pharmacy curriculum and the prerequisites over the past several decades, AIR analyzed the pharmacy category after screening for 5 or more years of college up to 37 years of age, 4 or more years of college for the age group 38-67 years, or 3 or more years of college for those 68 years or over. This screening process eliminated 1,388 persons on the PUMSA file, leaving 6,220. Application of the weighting factor resulted in an estimated number of 125,481 active civilian pharmacists. The standard error of this census estimate is 1,853, placing the 95-percent confidence interval from approximately 122,000 to 129,000.

AIR analysis determined that the best noncensus estimate of active pharmacists was the 1978-79 National Survey of Licensed Pharmacists sponsored by the National Center for Health Statistics (NCHS). The estimate from this survey is 138,383. The screened PUMSA estimate of 125,481 is 12,902 or 9 percent below the noncensus estimate. A further analysis by AIR of the minimum education and age screening criteria, which was responsible for the reduction of the estimate by 22,686 persons, supported the validity of its application to the census file. Their conclusion was that many of the persons screened

out do work in a pharmacy setting, but not as licensed pharmacists.

The AIR study attributed the overall low PUMSA estimate to several factors. The first included problems in the classification of those pharmacists who could fit into other health and nonhealth occupational categories, such as "scientists" or "owners or managers of retail stores." According to the professional association, a significant number of pharmacy school graduates move out of dispensing or clinical positions and become businessmen or pharmaceutical company employees. Some go into other health professions, including that of physicians. Under these circumstances, there may be discrepancies among different counts of the active pharmacist population. A second factor identified as affecting the census estimate was the absence of pharmacy teachers, who may have been coded into an occupation other than that of pharmacist.

The census files indicate that between 20 percent (PUMSA file) and 24 percent (EEO file) of pharmacists in 1980 were female. The BHP projection for December 1980 is 19 percent. In 1980, the census files estimated between 89.6 percent (EEO file) to 91.2 percent (PUMSA file) to be non-Hispanic white pharmacists, and 1.8 percent (PUMSA file) to 2.4 percent (EEO file) to be white pharmacists of Hispanic origin. The percent of white pharmacists reported by NCHS in its 1978 survey is 95.0 percent (adjusting for unknown race), and 1.5 percent were reported to be Hispanic. Black persons constituted between 2.3 percent (PUMSA file) and 3.2 percent (EEO file) of all pharmacists according to the 1980 census and 1.7 percent according to the NCHS. Asian and Pacific Islanders constituted 4.4-4.5 percent (census) and 3.2 percent (NCHS). About half of the total number of minority pharmacists identified by the 1980 census were Asian and Pacific Islanders, while the NCHS survey estimated two-thirds of all minority pharmacists to be Asian and Pacific Islanders.

There is close agreement between the State distributions of pharmacists on the two census files. The largest difference occurs in Illinois, and measures 1.3 percent.

Podiatrists

The screening criteria used by AIR on the podiatrist data accounted for the gradual lengthening of the podiatry curriculum and the changes in prerequisites over the past several decades. The estimated number of active podiatrists on the PUMSA file, after this screening, was 6,740. This estimate has a standard error of 429, so that the 95-percent confidence interval is from 5,882 to 7,598.

The AIR analysis of noncensus data sources determined that the best estimate for active civilian podiatrists in 1980 was the BHP estimate of 8,791 which is a projection from 1974 survey data. However, this number is 30 percent larger than the PUMSA estimate and substantially beyond the 95-percent confidence interval for that estimate. This difference is too large to be explained by podiatric faculty who could have been classified in another occupational category. The most likely explanation for this discrepancy would be the misclassification in the census of a substantial number of podiatrists, probably as physicians due to similar-sounding professional titles. Because

podiatry is such a small profession compared with medicine, this misclassification would have little impact on the physician estimates but a major impact on the podiatrist estimates.

Despite the apparently sizable undercounting of podiatrists in the 1980 census, demographic information from census and noncensus sources is in fairly good agreement. The EEO census file estimated that 8.4 percent of the podiatrists were female, while the PUMSA census file estimated 3.4 percent as female. The noncensus estimate is 4.9 percent female. Both census files estimated 5.6 percent of the podiatrists as minority, and between 3.6 percent (EEO file) and 4.1 percent (PUMSA file) as black persons. The noncensus estimates are 4.5 percent for minority and 3.3 percent for black persons. The State distribution for podiatrists between the two census files are similar and indicate that podiatrists are concentrated in five States (New York, Illinois, California, Ohio, and Pennsylvania) in which the colleges of podiatry are located and in one other (New Jersey) close to two of the States with schools.

Veterinarians

Due to changes in preveterinary requirements over the past decades, AIR screened this category for 5 years or more of college 55 years of age and for 4 years or more of college for 55 years or over. After weighting, the PUMSA screened count yielded an estimated 31,575 active veterinarians. (The standard error of this estimate is 292.)

The AIR analysis concluded that the best 1980 noncensus estimate for veterinarians was the BHP estimate of 34,146. The difference between the PUMSA estimate (31,575) and the noncensus estimate exceeds the 95-percent confidence interval of the census estimate. An AIR comparison of employment data revealed that the undercounting was concentrated among those veterinarians with Federal and, especially, college or university employment. Many of these veterinarians seem to have been classified as health specialty teachers, agricultural and forestry teachers, and agricultural and food scientists. The census and noncensus estimates are quite close in counting the numbers of private-practice veterinarians, and counts for State and local government and "other" veterinarians are also reasonably close.

The comparisons between census and noncensus sources are as follows for sex, race, and location by State. Two of the sources (PUMSA file and the American Veterinary Medical Association) estimated women to comprise 9.2 percent of the population of active veterinarians in 1980, while the EEO file estimate was 13.3 percent. These sources indicated that about 95 percent were non-Hispanic white veterinarians. The distributions by State given by the two census estimates are also close.

Despite the fact that the margin of error in the census data is not large, the AIR analysis concludes that the census data has "little utility," given the detailed data available from the masterfiles of the American Veterinary Medical Association.

Physician assistants

The census category of physician assistant included two other sets of occupations not commonly included when estimating these health personnel. The first set includes paramedics and ambulance

drivers, who tend to be employed by ambulance services or fire and safety departments. The second set includes those employed in hospitals, nursing care facilities, and other non-office-based health services as doctor's helpers or assistants. These persons probably have had limited or no formal training. To eliminate these two sets of occupations from the physician assistant file, a screen for industry type and for 3-year minimum postsecondary education was used by AIR. Based on this screening criterion, the PUMSA file yielded an estimate of 6,276 active civilian physician assistants.

The AIR final report describes in detail the problems associated with this occupational category and the lack of a clear minimum education criterion. Due to these problems, AIR analysis concludes that census estimates cannot be as accurate as existing noncensus counts based on surveys conducted by the American Academy of Physician Assistants (AAPA) and BHP estimate projections. Their analyses indicate that some large group of hospital-based personnel who are not physician assistants are in this census category and some actual physician assistants are excluded.

An example of the problems associated with the census estimates is the total of 30,437 physician assistants on the EEO file

This is about four times the number of active civilian physician assistants (7,718) in 1980 estimated from the best noncensus source. The total cannot exceed the cumulative number of persons who have passed the National Certifying Exam for physician assistants (11,000 by 1980).

The characteristics of those persons in this occupational group who were not employed by ambulance services or fire and public safety agencies, and who reported 3 years or more of college education were compared by AIR with those of certified physician assistants, as revealed by the 1978 and 1981 AAPA surveys, interpolated to 1980.

The PUMSA sample estimates that about two-thirds (66.4 percent) of physician assistants were male in 1980, compared with the AAPA estimate of 65.5 percent males. The PUMSA file indicates that 84.9 percent were non-Hispanic white physician assistants, 8.1 percent were black, 3.3 percent were Hispanic, and 3.4 percent were Asian and Pacific Islanders. The AAPA estimates are 90.2, 3.9, 2.1, and 1.1 percent, respectively. Thus the census estimates are accurate for sex but not as accurate for race, as they include too many minorities.

Registered nurses

The primary classification problem associated with this occupation is the inclusion on the census file of an unknown percent of licensed practical nurses (LPN's) who cannot be distinguished from the registered nurses (RN's) on the basis of their education as recorded by the census. Census coding rules classified ambiguous nursing titles (those that did not explicitly state "registered") into this occupational category rather than the LPN category. This decision is presumed to be based on the fact that RN's outnumber LPN's 2.5 to 1 in the population. However, the correspondence between job title and licensure in the nursing occupations is much more problematic than among the independent practitioners. For nursing personnel, title is not sufficient for unambiguous classification in all instances.

Those RN respondents intentionally excluded from this

occupational category by the 1980 census were those reporting themselves as "nursing administrators," "directors of nursing," "inservice coordinators or educators," and teachers of RN's or other nursing personnel.

The AIR analysis revealed one more ambiguity regarding the inclusion of job titles that refer to RN's in training or those that may include RN's who have graduated but not yet been licensed. Whether the nursing students actually got counted into this occupation would depend on whether they perceived themselves to be "employed."

The minimum educational requirements associated with licensure as an RN depend on the type of program. Basic nursing education requires 2-4 years of schooling and is offered in either a college or a noncollege hospital setting. Unfortunately, the 1980 census makes no provision for the reporting of training beyond high school other than college education, so nurses who went through 3-year diploma programs based in hospitals could have reported only 12 years of academic education to the census. This level of education leaves them indistinguishable from LPN's classified into this occupation on the basis of ambiguous job titles. The AIR analysis screened RN's in this occupation for 12 years or more of education. Separate analyses were also performed for the subgroup of cases with only 12 years of education or 1 year of college (the group considered most likely to contain a sizable percent of misclassified LPN's).

The PUMSA file generated a population estimate of 1,297,307 active RN's in 1980. Of these, 1,097,054 reported at least 2 years of college, while 200,153 reported only 12 years of high school or 1 year of college. The standard error for the census estimate of total active RN's is 5,957.

The best noncensus estimate is the 1980 Sample Survey of Registered Nurses conducted by the Research Triangle Institute for BHP. It estimated 1,227,900 active civilian RN's in April 1980.

Comparisons between the employed RN's in the census files and the 1980 Sample Survey reveals that after adjustments for nonresponse, 96.9 percent of the nurses in the sample survey were found to be female; for the census (excluding respondents with less than 12 years of education), the proportion was 96.0 percent (PUMSA file) and 95.9 percent (EEO file). In the 1980 survey 91.5 percent were not Spanish white nurses, compared with 86.7 percent in the EEO file and 87.8 percent in the PUMSA file. Hispanic nurses comprised 1.4 percent in the sample survey, 1.6 percent in the PUMSA file, and 2.1 percent in the EEO file. Black nurses comprised 4.4 percent in the sample survey, 6.5 percent in the PUMSA file, and 7.4 percent in the EEO files. Asians comprised 2.4 percent in the sample survey, 3.3 percent in the EEO file, and 3.6 percent in the PUMSA file.

Based on their analyses of the census and noncensus data sources, AIR concluded that the census estimate for total active RN's is between 5 and 17 percent too large.

Licensed practical nurses

It was not possible for AIR to screen for education for this occupation because some LPN's have received their licenses by waiver and others who completed standard training pro-

grams were trained during high school or entered training programs without having completed high school.

The PUMSA file produces an estimate of 449,998 active LPN's in 1980, with a standard error equal to 3,509.

At the time of the AIR analysis, there was no reliable noncensus LPN estimate. (Data from a 1983 sample survey of licensed practical nurses have since become available. This study was conducted by the Research Triangle Institute, under contract to the Division of Nursing of the U.S. Department of Health and Human Services.) A BHP 1980 estimate of 549,300 actively employed LPN's is based on a projection from the 1974 LPN sample survey. A low estimate of 470,708 LPN's is derived from a survey of State licensing boards by the National Association of Practical Nursing Education and Services.

Given the lack of reliable noncensus sources, AIR analysis focused on the census data, in an effort to determine the extent to which potential LPN's in the registered nurse category resemble LPN's in the LPN file. Therefore, respondents screened out of the RN category (for example, RNs with less than 12 years of education) were compared with LPN's in this file to consider whether the similarity of the two groups justified combining them. The AIR comparison indicated that the lowest education group in the RN category is somewhere between, or a mixture of, LPN's and nurse aides. Those with 12 years of high school or 1 year of college seem to be somewhere between other RN's and LPN's. Therefore, their conclusion was that the majority of the 12-year high school and 1-year college respondents in the RN category were indeed RN's.

Nursing aides, orderlies, and attendants

Educational backgrounds for these positions can be varied, ranging from persons with less than 12 years of high school to college-educated persons temporarily filling such a position. Compounding the problem is the lack of a single definitive list of job titles and inconsistencies in the aggregation of specific job titles for inclusion in this category.

The PUMSA file yields a population estimate of 1,423,612 active nursing aides, orderlies, and attendants. The standard error is 6,241.

As in the case of LPN's, there is no good noncensus estimate of the total number of nursing aides, orderlies, and attendants. When employment is considered, estimates are available for the number employed in hospitals from two sources—the annual hospital survey of the American Hospital Association (AHA) and the Bureau of Labor Statistics' Occupational Employment Statistics (OES) Survey. However, the AHA and OES estimates are not in close agreement with each other. (The OES survey is a periodic survey used to estimate total employment by type of occupation on a national, State, and selected area basis).

The AIR analysis concluded that "it is therefore not possible to draw conclusions regarding the reliability of the total census estimate of 1,423,612 active personnel. If the census estimate does contain an error, it would be in the direction of including too many persons (such as those) who perform custodial or clerical support functions and not direct patient care."²

Clinical laboratory technologists and technicians

This occupational category includes personnel at several different levels of training. Technologist-level personnel generally have 4 years or more of training. Technicians generally have 2 years, which is not necessarily college based. Consequently, no educational screening criterion was established by AIR for this category of health worker.

The PUMSA file produced an estimate of 247,833 active civilian clinical laboratory technologists and technicians in 1980. Added to this estimate was the number of medical scientists with less than 6 years of college. The combined estimate was 256,484, and the standard error for this figure is 2,105.

The AIR analysis concluded that there are no useful non-census sources for this occupation in 1980. Estimates of the number employed by hospitals are available from AHA and OES, and are in reasonably good agreement with each other. The adjusted OES estimate was preferred by AIR because the OES classification scheme is more compatible with the one used by the 1980 census. The adjusted OES estimate indicates that there were 140,502 hospital-employed clinical laboratory technologists and technicians and an additional 3,274 medical scientists (not controlling for year of education). These numbers are much smaller than the estimated 182,980 hospital-employed technologists and technicians in the census category and the 7,983 hospital-employed medical scientists. Even when only the respondents in the clinical laboratory category are considered, the census estimate of 42,478 is 30 percent larger than the adjusted OES estimate. Although ultrasound technologists were included by the census in this occupation and may not be included in OES estimates, they total only about 2,400 certified hospital-employed sonographers. Therefore, they could not possibly account for the observed difference.

According to AIR, the best explanation is that the census clinical laboratory category overestimates the numbers of active clinical laboratory technologists and technicians in 1980 due to the inclusion of laboratory personnel with less skill and training.

Dental hygienists and assistants

The PUMSA file produced an estimate of 48,494 active dental hygienists in 1980, with a standard error of 1,152. An estimate of 164,160 active dental assistants was produced, with a standard error of 2,119.

AIR analysis concluded that the best noncensus estimates for these two dental auxiliary personnel are derived from OES estimates modified by Division of Dentistry estimates of annual growth rates for these professions. Because the OES data come from workplace surveys that could count individuals with two employers twice, further modification of the dental hygienist estimate, reflecting the frequent employment of dental hygienists by more than one practice, was also carried out by AIR.

Census estimates for each of the dental auxiliary professions are higher than the adjusted OES estimates. The census estimate of 48,494 active dental hygienists is 3,754 (8.4 percent) higher than the noncensus estimate of 44,740. Over half this discrepancy can be explained by the nearly 2,000 dental hygienists employed by Federal, State, and local governments, most of whom were not counted by OES. The census estimate

for active dental assistants is 164,160, which is 30,720 (23.0 percent) larger than the noncensus estimate of 133,440. Only some 7,000 of these extra cases can be attributed to Federal, State, and local government employment.

The AIR analysis detected suspected problems with OES surveys of health services other than hospitals. These problems involved the exclusion of self-employed persons and the estimation rather than direct sampling of employees in establishments with fewer than four employees. Therefore, it is not possible to determine which estimate (census or OES) is more likely to be correct. However, the fact that both occupations are estimated higher in the census lead AIR to conclude that the problem is not one of misclassification within these dental auxiliary occupations (for example, dental assistants misclassified as dental hygienists).

Demographic data on dental hygienists can be compared with data produced by a survey of licensed dental hygienists conducted in 1979 and sponsored by the Division of Dentistry.⁶ Both sources characterized the profession as predominantly female (99 percent). Both sources also indicate that at least 95 percent of the dental hygienists are white.

No noncensus demographic data are available for dental assistants. Both census files indicate that 98 percent are female. Between 88.4 percent (EEO file) to 89.5 percent (PUMSA file) are non-Hispanic white assistants.

Dietitians

Both dietitians and dietetic technicians were included by the census in this occupational category. Unfortunately, disaggregation of these two groups within this category is impossible. Although registered dietitians have at least 4 years of college education, many uncertified personnel and dietetic technicians also have equivalent college education. This is particularly true because the requirement of a separate internship after graduation to become a registered dietitian is a barrier not overcome by some dietitian program graduates. Furthermore, although all dietary personnel certified by the American Dietetic Association (ADA) would have at least 2 years of post high school education, certified personnel and uncertified personnel overlap in the work force.

In addition to those census respondents who called themselves dietitians, nutritionists, or dietetic technicians despite the lack of any specialized training, respondents with the following food service titles were also included in this occupational category:

- Supervisor, diet (hospital; nursing and personal care facilities; and health services, not elsewhere classified (n.e.c.) only).
- Supervisor, food (hospital only).

These individuals do not have to be dietitians and could have almost any level of education.

The AIR analysis concluded, therefore, that this occupational category includes many individuals who were not trained in nutrition and dietetics, and that to use unscreened estimates from it is to seriously overcount the number of registered dietitians.

Therefore, the persons in this category on the PUMSA file were screened by AIR for education. Those who did not have 4 years or more of college were separated from those who did. These two groups were then used to derive population estimates for two sets of dietetic services personnel, the first set referred to as "dietitians," and the second as "other dietetic personnel."

The resulting estimate of the number of active dietitians in 1980 was 32,518, including 32,019 employed. The estimated population of active dietetic personnel with less than 4 years of college is 35,148, of whom 33,901 were employed. Standard errors for total active estimates are 943 and 980, respectively.

The AIR analyses of noncensus sources for this occupation discovered only limited noncensus estimates for dietetic service personnel. Within the hospital sector, there is an AHA estimate of 15,274 dietitians and 41,461 dietetic technicians. However, AIR believed that the later estimate contained large numbers of food service workers with no formal training. ADA estimates for registered dietitians (RD's) are also available, and they indicate an estimated 23,868 active RD's, including 13,104 in hospitals, at the time of the 1980 census.

Active dietitians in the census category with 4 years or more of college were 36 percent more than the estimated RD's. Those employed in hospitals were estimated to number 19,026, 25 percent larger than the AHA estimate of 15,274 for all dietitians in hospitals, and 45 percent larger than ADA estimate of 13,104 for RD's. According to AIR, these comparisons reinforce the conclusion that the 4-year college educational screen is imperfect and results in a population that probably includes a large fraction (up to one-third) of uncertified personnel or dietary workers with lesser responsibilities.

Health record technologists and technicians

The weighted PUMSA file produced an estimate of 15,398 active health record technologists and technicians in 1980, with a standard error of 649.

The AIR analysis of noncensus data sources revealed that there are not any reliable noncensus estimates for the total population of active medical record personnel. AHA estimates can be used in comparison with census estimates of medical record personnel employed in hospitals, although the classification procedures used by AHA and the census are not entirely compatible. AHA estimated 7,235 medical record administrations and 38,055 medical record technicians in hospitals in 1980. The latter figure, however, is believed to include sizable numbers of individuals at a clerical level.

This census category can be presumed to include a sizable proportion of medical record administrators (especially if they call themselves medical librarians, historians, or specialists) as well as medical record technicians. (The administrators are responsible for planning, developing, and administering medical record systems, and the technicians assist the administrators in the performance of their duties.) The census estimate of persons employed in hospitals as medical record administrators was 12,452, and census estimates indicate an additional 36,663 record clerks employed in hospitals. The combined estimate from these two categories is 49,115, only 3,825 (8.4 percent) greater than the combined AHA estimate of 45,290. According to AIR, hospital record clerks not employed in medical records

could easily account for this difference, "although ambiguities in the census classification of medical record administrators also serve to confound this comparison and could indicate a greater level of discrepancy than is apparent on the surface."²

The only source of comparative demographic information on medical record personnel found by AIR was a 1983 survey of members of the American Medical Record Association (AMRA). However, as this survey had only a 48-percent response rate, caution must be used in generalizing to the universe of AMRA members. In addition, because AMRA members include medical record administrators, medical record technicians, students, and others in unspecified proportions, it is impossible to determine which are the most appropriate census groups for comparisons.

With this caveat in mind, a study of the AMRA survey data showed the membership to be overwhelmingly female (96.8 percent of those respondents who indicated gender). Both census files had 91 percent of the respondents as female. The proportion of black AMRA member respondents (2.8) percent was much lower than the proportion in the census files (9.5 percent PUMSA and 9.8 percent EEO).

Occupational therapists

A screening criterion of 4 years of college (except for those 53 and over) was applied by AIR to this PUMSA file. This yielded an estimate of 14,435 active registered occupational therapists (OTR's), with a standard error of 628.

The AIR analysis of noncensus sources revealed that only rough estimates of the total population or particular subpopulations of occupational therapy personnel in 1980 can be made on the basis of available noncensus data. The best estimates for OTR's, adjusted to 1980, provide a range of from 17,800 (BHP and American Occupational Therapy Association) to 19,500 American Occupational Therapy Association persons. The PUMSA estimate of 14,435 OTR's who meet the basic educational requirements for registry is quite a bit lower from both of the noncensus estimates. According to AIR, a possible explanation for the low census estimate is that about 19-26 percent of the OTR's may have been placed by the census into other occupation groups for medicine and health managers and health specialties teachers. If, as estimated by BHP, such persons amount to 18 percent of the active OTR's, then the census might have as little as 82 percent of the population, which could then be estimated to total 17,604 active OTR's. This figure approximates the lowest noncensus estimate. However, such adjustment may also produce an overestimate because the AIR analysis found that in the other professions examined, the basic occupational category was used for many persons considered by their profession to be primarily administrators or teachers.

The census estimate of the number of OTR's employed in hospitals in 1980 is 7,766, with a standard error of 461. This estimate corresponds exactly to the adjusted AHA estimate of 7,766 (adjusted to exclude OTR's employed in facilities for the mentally retarded) and is 27 percent smaller than the adjusted OES estimate of 10,638 (adjusted to include Federal hospitals). Some uncertified personnel are probably included in the latter two estimates.

According to the census files, 92 percent (EEO) to 93

percent (PUMSA) of OTR's were female in 1980 (compared with the BHP's estimate of 95 percent in 1978). The census files indicate that 91 percent (EEO) to 95 percent (PUMSA) were non-Hispanic white OTR's. The BHP's 1978 estimate was 91 percent.

Physical therapists

An educational screening criterion of 4 years of college was applied by AIR to this PUMSA file. This yielded an estimate of 32,224 active physical therapists. A further adjustment was then made by AIR to include the 2 percent of physical therapists thought to lack 4 years of college, as indicated by the membership of the American Physical Therapy Association (APTA). This further adjustment yielded a census-based estimate of 32,882 active and 32,616 employed physical therapists. This estimate has a standard error of 886. The best noncensus estimates of the total number of physical therapists employed in the United States in 1980 were judged by AIR to be the APTA membership estimates, interpolated to 1980. The interpolated APTA estimate of 32,333 employed physical therapists is in very close agreement with the adjusted census estimate of 32,616 employed physical therapists.

There is also close agreement between the census estimate of the number of physical therapists employed in hospitals (18,578 when adjusted for the 2 percent with less than 4 years of college) and the adjusted OES estimate of 18,180. These two estimates, however, are somewhat higher than the APTA estimate of hospital employment, which is set as 14,420 in the interpolation to 1980.

APTA estimated from its 1978 and 1982 membership surveys the number of physical therapists who had "administration and management" or "teaching" as their primary professional responsibility. If these survey results are averaged to obtain intermediate 1980 estimates, the APTA would estimate 98 percent active physical therapists primarily in administration and management and 3.6 percent in teaching. If all of the managers and teachers had been coded into groups other than the physical therapist category by the census, the census estimate of 32,224 active physical therapists would include only 86.6 percent of the total population (37,210 persons). However, this approach probably overestimates the number of active physical therapists, because the census estimate of physical therapists employed in hospitals is so close to the adjusted OES estimate, which ought to have included the majority of managers, although perhaps not the teachers. The AIR conclusion is, therefore, that "the vast majority" of physical therapists who had teaching and management responsibilities were coded as physical therapists by the census.

Data from the APTA 1978 and 1982 member surveys permit some comparison with the census data. The proportion of female physical therapists, according to the census, is between 71.5 percent (PUMSA file) and 73.9 percent (EEO file). The APTA estimate (averaged for 1978 and 1982) is 71.7 percent. The census estimates that between 87.7 percent (EEO file) and 93.4 percent (PUMSA) are non-Hispanic white persons while APTA estimates that 96.0 percent are "Caucasian" and 0.8 percent are Hispanic persons. The census and APTA estimates of the proportion of black persons are 6.8 percent (EEO file) to 3.3 percent (PUMSA file) versus 1.3 percent

(APTA). The census estimate of the number of black persons appears slightly high, at least when compared with APTA membership.

In general, the AIR analysis indicated that the census data for physical therapists are better than the data for many of the other allied health occupations.

Radiologic technicians

No screen for minimum educational preparation can be applied to this occupational category because educational requirements for radiologic personnel (even at the technologists level) are not entirely uniform. Accredited training programs can be located in hospitals, vocational schools, or colleges and universities, and they range from 1 to 4 years of post-high-school preparation. In addition, as is true in many of the allied health occupations, personnel are working in the field who are not accredited and who did not have any formal post-high-school education. There also is no effective maximum educational screen because many radiologic therapists are also registered nurses or medical technologists and because a small number of master's- and even doctoral-level degrees have been awarded in radiologic therapy.

Radiologic technology personnel are primarily counted by the census in the occupational group for radiologic technicians, which includes both radiologic technologists and radiologic technicians, as well as the technologist and technician tiers in nuclear medicine.

However, the job title list used by the census for this occupation omits one of the primary professional titles (radiographer). Instead, this job title, which is often used interchangeably with radiologic technologist, was included in the occupation for "technicians, n.e.c." in addition, only radiographers in hospitals, nursing and personal care facilities, and health services, n.e.c., were classified into this occupation group. Others were classified into the occupation for "science technicians, n.e.c." Therefore, the AIR analysis attempted to disaggregate this radiologic group of personnel from the non-health-related occupations in "technicians, n.e.c." Analysis of this group was then carried out by AIR but kept separate from the analysis of the radiologic technicians group.

The number of cases in the PUMSA file for the category of radiologic technicians, when weighted, yield an estimate of 96,825 active radiologic technologists and technicians, of whom 95,391 were employed at the time of the census. Among these employed respondents, 74,500 (or 78 percent) were employed in hospitals in 1980, with an additional 11,664 (or 12.2 percent) employed in physicians' offices. About 7.9 percent were employed in other health care facilities, and 1.7 percent in other non-health-care industries. The census estimate of 74,500 radiologic technicians and technologists employed in hospitals was compared by AIR with OES, AHA, and the American Registry of Radiologic Technicians (ARRT) hospital employment estimates. These estimates are 75,158, 68,719, and 67,439, respectively. The census estimate would appear to be somewhat high compared with the AHA and ARRT estimates, but the latter include only certified (technologist-level) personnel. Of those in the health care industries, the census estimate of 79.5 percent employed in hospitals corresponds closely to the ARRT estimate of 79.9 percent.

While general correspondence of these estimates would seem to indicate that no radiographers in health care settings were coded into the "technicians, n.e.c.," category, the AIR analysts do not believe that this conclusion is justified. This is because the title "radiographer" appears in the category "technicians, n.e.c." and is the preferred title for professionals who primarily do diagnostic x rays and scans.

The estimated number of active radiographers on the PUMSA file for "technicians, n.e.c." is 16,699, with 16,257 employed. The majority of these persons are employed by hospitals (11,154 or 68.6 percent). About 10 percent are employed in the offices of physicians, 2.8 percent are in nursing care facilities, 4.4 percent in offices of other types of health practitioners, and the remaining 14.4 percent in health services, n.e.c. Their distribution in industries, therefore, approximates the distribution for the radiologic technologists and technicians in the radiologic technician category, although the radiographers are somewhat less likely to be employed by hospitals or physicians and somewhat more likely to be employed in health services, n.e.c. (an industry category that includes "x-ray offices" and "x-ray laboratories" as well as medical and dental clinics).

The AIR analysis also revealed that those in the "technicians, n.e.c." category have a somewhat higher level of education than the radiologic technicians and technologists—56 percent have 2 years or more of college, compared with 20 percent of those in the radiologic technician category. This difference in level of education is to be expected, according to AIR, because the radiologic technician category includes technicians and technologists, whereas radiographer is a technologist-level job title.

The AIR analysis of these two categories concludes that the census estimates for radiologic technology personnel based on the occupational category radiologic technicians should include some of those in the "Technicians, n.e.c.," group in health care industries. Thus it is only possible to produce maximum and minimum estimates of the numbers of radiologic technology personnel from census data. The range developed by the AIR analysis is an estimate of between 96,825 and 113,524 active civilian radiologic technology personnel from the census data.

No reliable noncensus data were found by AIR for comparison with the census radiologic data.

Inhalation therapists

Because college education, while available, is not required for employment as respiratory therapy personnel, no educational screen was developed by AIR for this occupation.

The PUMSA estimate for this occupation was 50,472 active respiratory therapists, with a standard error of 1,175. About 96 percent of the employed respiratory therapists, or 47,549 individuals, worked in hospitals, with a standard error of 1,141.

According to AIR, the best noncensus estimate for employed respiratory therapy personnel in hospital settings is from a 1981-82 survey by the American Association of Respiratory Therapists (AART). This survey estimate is 63,181, which includes 46,473 registered and certified or graduated therapists and technicians and 16,708 other personnel above the aide level who were classified as on-the-job trainees. The number of therapists and technicians alone compares closely with the census count of 47,549 respiratory therapists employed in hospitals—the

discrepancy is only 1,076, less than the standard error of the census estimate. However, caution must be used when citing the survey results because the error of the AART estimate may be much larger. This is because it is based on a survey with a response rate lower than 40 percent, and because the adjustment from winter 1981 to spring 1980 was determined by assuming a constant rate of growth between mid-1977 and late 1981.

The 1981-82 AART survey reported data for all personnel employed by hospital departments of respiratory therapy, including on-the-job trainees, RN's, physical therapists, aides and assistants, nonmedical interns, clerical workers, and other workers, as well as the therapists and technicians counted by the census. Consequently, exact agreement between AART and the census estimate are not possible. The AIR analysis revealed that the demographic data are in reasonable agreement between the two sources. As might be expected from the exclusion of sizable numbers of aides, assistants, and clerical workers, census data show a somewhat lower proportion of female workers (56 percent on both census files versus 61 percent for the AART survey). The racial distributions are very similar in the two sources. Both agree that 82 percent are non-Hispanic white persons and that black persons comprise the largest minority (10 percent).

In summary, the AIR analysis concluded that "the census estimate of 50,472 total active respiratory therapy personnel is a reliable measure of therapist and technician level personnel," and, therefore, "can be used with reasonable confidence."²

Speech therapists

The AIR analysis set a screening requirement of 4 years of college education for this occupation. The resulting estimate of the total number of active speech and hearing therapists on the PUMSA file is 39,805, with a standard error of 1,044.

According to the AIR analysis of noncensus sources, the best estimates of employed speech and language pathologists and audiologists are the OES estimate as adjusted by the American Speech-Language-Hearing Association of 42,198 and the BHP projection to 1980 of 42,095. The PUMSA estimate of 39,436 is very close to the OES estimate if the teachers of speech pathology (40,245) are deleted. Teachers were presumed by AIR to have been classified by the census into the occupation for health specialties teachers.

Both census files (PUMSA and EEO) indicate that 11 percent of the speech and hearing therapists in 1980 were male. American Speech-Language-Hearing Association membership data suggest a figure of 15 percent. According to the census, 92-93 percent were non-Hispanic white persons, 1.5-1.7 percent were white Hispanic persons, 4.3-4.9 percent were black persons, and 0.9-1.1 percent were Asian and Pacific Islanders.

The AIR analysis of this occupation concludes that "the census estimate of 39,805 total active speech and hearing therapists is in close agreement with the best noncensus estimates, particularly if teachers of speech therapy are excluded from the noncensus estimate."²

The remaining health occupations included in the first portion of this report are heterogeneous occupational categories used as catch-all groups by the census. As such, they bear no correspondence to any specific health professions and will not be discussed in this section.

Conclusions and recommendations

For 1980, health manpower data are available from three sources: 1980 decennial census counts, employment survey data from the American Hospital Association and the Bureau of Labor Statistics, and various membership and survey estimates from the Federal government and health professional associations. This report summarizes the findings of a comparative study of the decennial census data and the other data sources.

No single conclusion or recommendation is possible, as the results of this comparative analysis vary by occupation. Table C summarizes the agreement between the census estimates and the best other source for each of these occupations.

In general, the estimates based on census data are of limited interest if other reliable estimates are available. This is the case for the independent health practitioners and registered nurses, where data are available from the respective health profession associations.

Concerning the allied health occupations, for which there are no good alternative sources of supply data, the census data

are of greater value. However, it must be noted that the very absence of reliable alternative estimates for these professions means that the census estimates cannot be confirmed. As the American Institutes for Research analysis states, "the best that can be said is that, when more than one noncensus estimate was available for a profession, the census/noncensus discrepancy was generally no greater than the discrepancy between the different noncensus sources."² Therefore, the allied health supply estimates from the 1980 census are likely to be used, because they may well be the only comprehensive estimates available for these professions.

Comparisons of demographic characteristics from census and noncensus sources indicate that, for those occupations where the estimates match or are slightly undercounted by the census, the census data are in reasonable agreement with the other sources. However, for those occupations where the census overestimates the total supply because of classification or definition differences, the characteristic data become less reliable because

Table C. Agreement between health occupations and supply estimates based on 1980 decennial census and other sources

Occupation	U.S. Bureau of the Census estimate ¹	American Institutes for Research adjusted estimate ²	Other estimate ²
Physicians	433,255	408,300	430,200
Dentists	125,291	118,100	118,300
Optometrists	24,605	22,700	21,300
Pharmacists	145,637	125,500	138,400
Podiatrists	7,781	6,700	8,800
Veterinarians	34,355	31,600	34,100
Physician assistants	30,437	6,300	7,700
Registered nurses	1,285,299	1,297,300	1,227,900
Licensed practical nurses	435,176	450,000	549,300
Nursing aides, orderlies, and attendants	1,378,118	1,423,600	(³)
Clinical laboratory technologists and technicians	243,982	247,600	(³)
Dental hygienists	46,192	48,500	44,700
Dental assistants	158,117	164,200	122,400
Dietitians	67,270	32,500	23,900
Health record technologists and technicians	15,147	15,400	(³)
Occupational therapists	17,756	14,400	17,800
Physical therapists	43,075	32,200	32,300
Radiologic technicians	96,311	96,800	75,200
Inhalation therapists	48,738	50,500	(³)
Speech therapists and audiologists	41,296	39,800	42,100

¹Based on cases with nonallocated occupation, age, and education on the 5-percent Public Use Microdata Sample A file.

²American Institutes for Research and other estimates are rounded to nearest 100.

³No acceptable other estimate for total 1980 supply is available for this occupation.

NOTE: See the body of this report for a more detailed summary of estimate comparisons. Noncensus estimates are highly variable in reliability and in the extent to which they measure the same population being estimated by the census. It should not be assumed, therefore, that census data are unreliable for occupations exhibiting a large discrepancy in the last column. However, a small discrepancy does not, by itself, confirm the reliability of census data.

the extraneous cases tend to distort the overall distributions in a nonrandom way. Such was the case, for example, with the registered nurse distributions, and especially the physician assistant distributions.

For most allied health occupations, information on employment, especially hospitals, can be estimated from the American Hospital Association or the Occupational Employment Statistics survey data. In many cases the registered or certified

component of the allied health supply (but not the entire workforce) can be estimated from professional society surveys or membership rosters. However, as the American Institutes for Research analysis indicates, most of these later data sources have methodological problems as well as problems describing a restricted population, and the response rates may be low. Census-based estimates, therefore, are a viable alternative, and can be used with suitable qualification.

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List of detailed tables

1. Number of persons in health occupations by occupation and sex: United States, 1980	18	15. Number of dental assistants, by State, place of residence, race, Hispanic origin, and sex: United States, 1980.	32
2. Number of persons in health occupations by occupation, race, and Hispanic origin: United States, 1980	19	16. Number of dietitians, by State, place of residence, race, Hispanic origin, and sex: United States, 1980	33
3. Number of physicians, by State, place of residence, race, Hispanic origin, and sex: United States, 1980	20	17. Number of health record technologists and technicians, by State, place of residence, race, Hispanic origin, and sex: United States, 1980	34
4. Number of dentists, by State, place of residence, race, Hispanic origin, and sex: United States, 1980	21	18. Number of occupational therapists, by State, place of residence, race, Hispanic origin, and sex: United States, 1980	35
5. Number of optometrists, by State, place of residence, race, Hispanic origin, and sex: United States, 1980	22	19. Number of physical therapists, by State, place of residence, race, Hispanic origin, and sex: United States, 1980.	36
6. Number of pharmacists, by State, place of residence, race, Hispanic origin, and sex: United States, 1980	23	20. Number of radiologic technicians, by State, place of residence, race, Hispanic origin, and sex: United States, 1980	37
7. Number of podiatrists, by State, place of residence, race, Hispanic origin, and sex: United States, 1980	24	21. Number of inhalation therapists, by State, place of residence, race, Hispanic origin, and sex: United States, 1980	38
8. Number of veterinarians, by State, place of residence, race, Hispanic origin, and sex: United States, 1980	25	22. Number of speech therapists, by State, place of residence, race, Hispanic origin, and sex: United States, 1980.	39
9. Number of physician assistants, by State, place of residence, race, Hispanic origin, and sex: United States, 1980.	26	23. Number of health diagnosing practitioners, n.e.c., by State, place of residence, race, Hispanic origin, and sex: United States, 1980.	40
10. Number of registered nurses, by State, place of residence, race, Hispanic origin, and sex: United States, 1980.	27	24. Number of health technologists and technicians, n.e.c., by State, place of residence, race, Hispanic origin, and sex: United States, 1980	41
11. Number of licensed practical nurses, by State, place of residence, race, Hispanic origin, and sex: United States, 1980	28	25. Number of health aides, except nursing, by State, place of residence, race, Hispanic origin, and sex: United States, 1980	42
12. Number of nursing aides, orderlies, and assistants, by State, place of residence, race, Hispanic origin, and sex: United States, 1980.	29	26. Number of therapists, n.e.c., by State, place of residence, race, Hispanic origin, and sex: United States, 1980.	43
13. Number of clinical laboratory technologists and technicians, by State, place of residence, race, Hispanic origin, and sex: United States, 1980	30		
14. Number of dental hygienists, by State, place of residence, race, Hispanic origin, and sex: United States, 1980.	31		

Table 1. Number of persons in health occupations by occupation and sex: United States, 1980

<i>Occupation</i>	<i>Both sexes</i>	<i>Males</i>	<i>Females</i>
Total	5,187,033	1,190,320	3,996,713
Health diagnosing occupations	646,826	570,546	76,280
Physicians	433,255	375,289	57,966
Dentists	125,291	116,916	8,375
Veterinarians	34,355	29,797	4,558
Optometrists	24,605	22,569	2,036
Podiatrists	7,781	7,124	657
Health diagnosing practitioners, n.e.c. ¹	21,539	18,851	2,688
Health assessment and treating occupations	1,722,576	240,569	1,482,007
Registered nurses	1,285,299	52,755	1,232,544
Pharmacists	145,637	110,635	35,002
Dietitians	67,270	6,787	60,483
Therapists	193,933	52,181	141,752
Inhalation therapists	48,738	21,179	27,559
Occupation therapists	17,756	1,499	16,257
Physical therapists	43,075	11,234	31,841
Speech therapists	41,296	4,485	36,811
Therapists, n.e.c. ¹	43,068	13,784	29,284
Physician assistants	30,437	18,211	12,226
Technicians and related support occupations	989,347	162,175	827,172
Clinical laboratory technologists and technicians	243,982	62,175	181,807
Dental hygienists	46,192	708	45,484
Health record technologists and technicians	15,147	1,314	13,833
Radiologic technicians	96,311	27,356	68,955
Licensed practical nurses	435,176	14,764	420,412
Health technologists and technicians, n.e.c. ¹	152,539	55,858	96,681
Health service occupations	1,828,284	217,030	1,611,254
Dental assistants	158,117	3,294	154,823
Health aides, except nursing	292,049	45,375	246,674
Nursing aides, orderlies, and attendants	1,378,118	168,361	1,209,757

¹ n.e.c. = not elsewhere classified.

Table 2. Number of persons in health occupations by occupation, race, and Hispanic origin: United States, 1990

Occupation	All races	White non- Hispanic	Total minority	Black non- Hispanic	Hispanic	Native Americans	Asian and Pacific Islanders	Other minority
Total	5,187,033	4,082,043	1,104,990	718,462	198,382	25,741	156,562	5,843
Health diagnosing occupations	646,826	557,625	89,201	17,696	22,246	838	47,413	1,008
Physicians	433,255	357,842	75,413	13,243	18,853	513	41,918	886
Dentists	125,291	115,880	9,411	3,134	2,193	185	3,832	67
Veterinarians	34,355	32,922	1,433	522	388	62	432	29
Optometrists	24,605	23,309	1,296	254	432	44	558	8
Podiatrists	7,781	7,343	438	281	62	0	95	0
Health diagnosing practitioners, n.e.c. ¹	21,539	20,329	1,210	262	318	34	578	18
Health assessment and treating occupations	1,722,576	1,484,576	238,000	133,444	41,562	5,327	55,971	1,696
Registered nurses	1,285,299	1,114,314	170,985	95,372	27,540	3,856	42,946	1,271
Pharmacists	145,637	130,436	15,201	4,715	3,492	247	6,582	165
Dietitians	57,270	47,513	19,757	14,400	2,483	332	2,483	59
Therapists	193,933	167,504	26,429	15,950	6,296	681	3,328	174
Inhalation therapists	48,738	39,835	8,903	5,106	2,586	208	970	33
Occupational therapists	17,756	16,158	1,598	774	330	50	428	16
Physical therapists	43,075	37,797	5,278	2,930	1,276	111	925	36
Speech therapists	41,296	38,060	3,236	2,039	711	76	382	28
Therapists, n.e.c. ¹	43,068	35,654	7,414	5,101	1,393	236	623	61
Physician assistants	30,437	24,809	5,628	3,007	1,751	211	632	27
Technicians and related support occupations	989,347	783,619	205,728	136,176	37,126	5,136	26,219	1,071
Clinical laboratory technologists and technicians	243,982	191,214	52,768	28,076	10,092	862	13,498	240
Dental hygienists	46,192	44,125	2,067	699	754	37	554	23
Health record technologists and technicians	15,147	12,422	2,725	1,478	602	176	441	28
Radiologic technicians	96,311	82,099	14,212	7,897	3,977	377	1,862	99
Licensed practical nurses	435,176	333,132	102,044	77,852	15,062	2,790	5,897	443
Health technologists and technicians, n.e.c. ¹	152,539	120,627	31,912	20,174	6,639	894	3,967	238
Health service occupations	1,828,284	1,256,223	572,061	431,146	97,448	14,440	26,959	2,068
Dental assistants	158,117	139,746	18,371	6,635	8,391	632	2,436	77
Health aides, except nursing	292,049	215,271	76,778	52,302	17,477	1,918	4,831	250
Nursing aides, orderlies, and attendants	1,378,118	901,206	476,912	372,209	71,580	11,690	19,692	1,741

¹ n.e.c. = not elsewhere classified.

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 3. Number of physicians, by State, place of residence, race, Hispanic origin, and sex: United States, 1980

[Figures in this table may not add to totals because of rounding to nearest hundred]

State	Place of residence								Race and Hispanic origin							
	Total			Urban		Rural			White		Black		Other		Hispanic	
	Both sexes	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	
Total.....	4,333	3,753	580	1,638	302	2,115	277	3,171	407	101	32	318	115	163	26	
Alabama.....	51	46	5	18	3	28	3	42	4	2	-	2	1	1	-	
Alaska.....	6	5	1	3	1	2	-	5	1	-	-	-	-	-	-	
Arizona.....	54	49	5	31	3	18	2	45	4	-	-	2	-	2	-	
Arkansas.....	28	25	2	12	1	14	1	24	2	-	-	1	-	-	-	
California.....	556	481	75	267	47	214	27	412	54	15	4	39	12	15	5	
Colorado.....	60	53	7	32	5	21	3	50	7	1	-	1	-	1	-	
Connecticut.....	75	66	9	21	3	45	5	59	7	1	-	5	1	1	-	
Delaware.....	11	9	2	1	1	8	1	7	1	-	-	1	1	1	-	
District of Columbia.....	18	15	4	15	4	-	-	10	3	4	1	-	-	-	-	
Florida.....	195	171	24	65	9	106	15	127	16	3	1	8	2	33	5	
Georgia.....	80	73	7	17	2	56	6	63	5	3	1	3	1	4	-	
Hawaii.....	16	14	2	9	1	5	1	9	1	-	-	6	1	-	-	
Idaho.....	12	11	1	3	-	8	-	11	1	-	-	-	-	-	-	
Illinois.....	229	189	40	85	22	104	18	138	22	7	3	34	13	10	2	
Indiana.....	72	65	7	26	4	39	3	57	6	1	-	6	1	1	-	
Iowa.....	39	36	3	15	2	20	1	33	3	-	-	2	-	1	-	
Kansas.....	43	38	5	14	2	24	3	33	3	-	-	3	1	1	-	
Kentucky.....	50	43	7	14	2	29	4	38	5	1	-	3	1	1	-	
Louisiana.....	65	58	7	40	5	19	2	51	6	2	1	3	1	2	-	
Maine.....	19	17	2	1	1	15	1	16	2	-	-	1	-	-	-	
Maryland.....	121	100	22	34	9	66	13	76	13	6	2	11	6	7	1	
Massachusetts.....	151	126	24	60	14	67	10	116	21	1	-	7	3	2	-	
Michigan.....	169	145	24	57	13	88	11	115	15	6	2	20	6	4	1	
Minnesota.....	75	68	8	27	4	41	4	64	6	-	-	3	1	1	-	
Mississippi.....	27	24	3	7	1	17	2	22	2	1	-	1	-	-	-	
Missouri.....	85	75	10	20	4	55	6	63	7	2	1	6	1	3	1	
Montana.....	11	10	1	3	-	8	1	10	1	-	-	-	-	-	-	
Nebraska.....	24	21	3	12	2	9	1	20	3	-	-	1	-	-	-	
Nevada.....	11	10	1	6	-	4	1	9	1	-	-	-	-	-	-	
New Hampshire.....	14	14	1	3	-	11	1	13	1	-	-	-	-	-	-	
New Jersey.....	168	141	27	26	6	115	22	109	13	5	1	21	12	6	1	
New Mexico.....	24	20	4	10	2	10	3	17	3	-	-	1	-	2	-	
New York.....	476	391	85	210	56	181	28	307	51	14	4	53	26	18	4	
North Carolina.....	89	78	11	31	4	47	7	72	10	2	1	3	-	1	-	
North Dakota.....	10	9	1	2	-	7	1	8	-	-	-	1	-	-	-	
Ohio.....	183	160	23	52	9	108	13	129	16	5	1	20	5	6	1	
Oklahoma.....	44	40	4	23	3	17	1	37	3	-	-	2	1	1	-	
Oregon.....	49	44	6	14	3	29	3	42	5	-	-	1	1	-	-	
Pennsylvania.....	237	205	32	71	16	134	16	179	24	4	1	17	6	5	1	
Rhode Island.....	18	16	2	9	1	7	1	15	2	-	-	1	-	-	-	
South Carolina.....	39	35	4	9	2	26	3	33	3	1	-	1	1	1	-	
South Dakota.....	7	7	1	2	-	5	1	6	1	-	-	-	-	-	-	
Tennessee.....	74	65	9	34	5	32	4	59	7	2	1	3	1	1	-	
Texas.....	230	206	24	132	17	74	7	172	18	3	2	10	3	21	1	
Utah.....	25	22	3	10	1	13	1	21	2	-	-	1	-	-	-	
Vermont.....	11	9	2	-	-	9	2	9	2	-	-	-	-	-	-	
Virginia.....	100	87	13	34	5	52	8	74	10	3	1	6	2	3	-	
Washington.....	72	65	7	26	4	39	3	62	6	1	-	2	-	-	-	
West Virginia.....	28	24	3	5	1	20	3	18	2	-	-	4	1	2	-	
Wisconsin.....	74	66	8	20	3	46	4	60	6	1	-	4	1	1	-	
Wyoming.....	5	5	1	1	-	4	-	5	1	-	-	-	-	-	-	

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 4. Number of dentists, by State, place of residence, race, Hispanic origin, and sex: United States, 1980

[Figures in this table may not add to totals because of rounding to nearest hundred]

State	Place of residence							Race and Hispanic origin							
	Total		Urban		Rural			White		Black		Other		Hispanic	
	Both sexes	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total	1,253	1,169	84	389	38	780	46	1,090	69	27	5	34	6	18	4
Alabama	14	14	1	4	-	9	-	13	1	-	-	-	-	-	-
Alaska	2	2	-	1	-	1	-	2	-	-	-	-	-	-	-
Arizona	13	12	1	7	1	5	-	12	1	-	-	-	-	-	-
Arkansas	7	7	-	2	-	5	-	7	-	-	-	-	-	-	-
California	153	140	12	70	8	70	4	117	8	3	-	16	3	5	1
Colorado	18	17	1	9	1	8	1	16	1	-	-	1	-	-	-
Connecticut	26	25	1	7	1	18	1	24	1	-	-	-	-	-	-
Delaware	2	2	-	-	-	2	-	2	-	-	-	-	-	-	-
District of Columbia	3	3	1	3	1	-	-	1	-	1	-	-	-	-	-
Florida	52	46	7	14	2	32	4	41	5	1	-	-	-	4	1
Georgia	25	22	4	5	1	17	3	21	3	1	-	-	-	-	-
Hawaii	6	6	-	3	-	2	-	1	-	-	-	5	-	-	-
Idaho	6	5	-	1	-	4	-	5	-	-	-	-	-	-	-
Illinois	62	57	5	20	2	37	3	54	4	1	-	1	-	-	-
Indiana	23	22	1	6	-	16	1	21	1	-	-	-	-	-	-
Iowa	14	13	1	4	-	9	1	13	1	-	-	-	-	-	-
Kansas	13	12	1	4	-	8	-	12	1	-	-	-	-	-	-
Kentucky	13	13	1	2	-	10	1	13	1	-	-	-	-	-	-
Louisiana	20	18	3	10	2	7	1	17	2	-	-	-	-	-	-
Maine	4	4	-	-	-	4	-	4	-	-	-	-	-	-	-
Maryland	27	25	2	6	1	19	2	21	2	2	-	1	-	-	-
Massachusetts	39	37	2	10	1	27	1	35	2	-	-	1	-	-	-
Michigan	54	52	2	16	1	36	1	49	2	2	-	1	-	-	-
Minnesota	26	24	2	5	1	19	1	24	2	-	-	-	-	-	-
Mississippi	8	7	-	1	-	6	-	7	-	1	-	-	-	-	-
Missouri	21	20	1	3	-	17	1	20	1	-	-	-	-	-	-
Montana	6	6	-	1	-	5	-	5	-	-	-	-	-	-	-
Nebraska	9	8	1	3	-	5	-	8	1	-	-	-	-	-	-
Nevada	4	4	†	2	-	1	-	3	1	-	-	-	-	-	-
New Hampshire	4	4	-	1	-	3	-	4	-	-	-	-	-	-	-
New Jersey	50	47	2	7	1	41	2	45	2	1	-	1	-	1	-
New Mexico	5	5	-	2	-	3	-	4	-	-	-	-	-	1	-
New York	131	124	7	46	4	78	3	118	5	3	-	2	1	1	-
North Carolina	24	21	2	6	1	16	2	20	2	1	-	-	-	-	-
North Dakota	2	2	-	-	-	2	-	2	-	-	-	-	-	-	-
Ohio	53	50	3	11	1	39	2	48	3	1	-	1	-	-	-
Oklahoma	12	11	1	5	-	6	1	10	1	-	-	-	-	-	-
Oregon	20	19	1	4	-	15	1	18	1	-	-	-	-	-	-
Pennsylvania	72	68	3	17	1	51	2	65	3	1	-	2	-	-	-
Rhode Island	5	5	-	2	-	3	-	5	-	-	-	-	-	-	-
South Carolina	13	10	2	2	-	9	2	10	2	-	-	-	-	-	-
South Dakota	3	3	-	1	-	2	-	2	-	-	-	-	-	-	-
Tennessee	22	20	2	8	1	12	1	18	2	1	-	-	-	-	-
Texas	61	58	2	33	2	26	1	54	2	1	-	1	-	3	-
Utah	10	9	-	2	-	7	-	9	-	-	-	-	-	-	-
Vermont	3	3	-	-	-	3	-	3	-	-	-	-	-	-	-
Virginia	25	23	2	7	1	17	1	22	2	1	-	-	-	-	-
Washington	29	28	1	6	-	21	1	27	1	-	-	1	-	-	-
West Virginia	7	7	1	2	-	5	-	6	1	-	-	-	-	-	-
Wisconsin	31	28	2	7	1	22	1	28	2	-	-	-	-	-	-
Wyoming	2	2	-	-	-	2	-	2	-	-	-	-	-	-	-

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 5. Number of optometrists, by State, place of residence, race, Hispanic origin, and sex: United States, 1980

[Figures in this table may not add to totals because of rounding to nearest hundred]

State	Total			Place of residence				Race and Hispanic origin							
	Both sexes		Female	Urban		Rural		White		Black		Other		Hispanic	
	Male	Female		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total.....	246	226	20	71	8	155	12	215	18	2	1	5	1	3	1
Alabama.....	2	2	-	-	-	2	-	2	-	-	-	-	-	-	-
Alaska.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arizona.....	4	4	1	2	-	1	-	3	1	-	-	-	-	-	-
Arkansas.....	2	2	-	-	-	1	-	2	-	-	-	-	-	-	-
California.....	31	28	3	16	2	12	1	24	2	-	-	3	1	1	-
Colorado.....	3	2	1	1	-	1	-	2	1	-	-	-	-	-	-
Connecticut.....	3	2	-	-	-	2	-	2	-	-	-	-	-	-	-
Delaware.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
District of Columbia.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Florida.....	9	8	1	2	-	6	1	8	1	-	-	-	-	1	-
Georgia.....	3	3	-	1	-	3	-	3	-	-	-	-	-	-	-
Hawaii.....	1	1	-	1	-	1	-	-	-	-	-	1	-	-	-
Idaho.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Illinois.....	17	15	2	5	1	10	1	14	2	1	-	-	-	-	-
Indiana.....	8	8	1	1	-	6	1	8	1	-	-	-	-	-	-
Iowa.....	5	5	-	1	-	4	-	5	-	-	-	-	-	-	-
Kansas.....	4	4	-	1	-	3	-	4	-	-	-	-	-	-	-
Kentucky.....	3	3	-	1	-	2	-	3	-	-	-	-	-	-	-
Louisiana.....	3	2	1	1	-	1	-	2	-	-	-	-	-	-	-
Maine.....	2	2	-	-	-	2	-	2	-	-	-	-	-	-	-
Maryland.....	4	3	-	1	-	3	-	3	-	-	-	-	-	-	-
Massachusetts.....	8	7	1	1	1	5	-	7	1	-	-	-	-	-	-
Michigan.....	9	8	1	2	-	6	-	8	1	-	-	-	-	-	-
Minnesota.....	4	4	-	1	-	3	-	4	-	-	-	-	-	-	-
Mississippi.....	2	2	-	-	-	2	-	2	-	-	-	-	-	-	-
Missouri.....	6	5	1	1	-	4	1	5	1	-	-	-	-	-	-
Montana.....	2	2	-	-	-	1	-	1	-	-	-	-	-	-	-
Nebraska.....	2	2	-	-	-	2	-	2	-	-	-	-	-	-	-
Nevada.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
New Hampshire.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
New Jersey.....	7	7	-	1	-	6	-	7	-	-	-	-	-	-	-
New Mexico.....	2	2	-	-	-	2	-	2	-	-	-	-	-	-	-
New York.....	18	18	1	7	1	10	-	17	1	-	-	-	-	-	-
North Carolina.....	5	5	-	1	-	4	-	5	-	-	-	-	-	-	-
North Dakota.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Ohio.....	12	11	1	3	-	9	-	11	1	-	-	-	-	-	-
Oklahoma.....	4	3	-	1	-	2	-	3	-	-	-	-	-	-	-
Oregon.....	4	3	-	1	-	3	-	3	-	-	-	-	-	-	-
Pennsylvania.....	14	13	1	3	-	10	1	13	1	-	-	-	-	-	-
Rhode Island.....	1	1	-	1	-	-	-	1	-	-	-	-	-	-	-
South Carolina.....	2	2	-	-	-	2	-	2	-	-	-	-	-	-	-
South Dakota.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Tennessee.....	4	4	1	1	-	3	1	4	1	-	-	-	-	-	-
Texas.....	10	10	-	6	-	4	-	9	-	-	-	-	-	1	-
Utah.....	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-
Vermont.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Virginia.....	4	4	-	1	-	3	-	4	-	-	-	-	-	-	-
Washington.....	5	5	1	1	-	4	-	4	1	-	-	-	-	-	-
West Virginia.....	2	2	-	-	-	1	-	2	-	-	-	-	-	-	-
Wisconsin.....	6	5	-	1	-	4	-	5	-	-	-	-	-	-	-
Wyoming.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 6. Number of pharmacists, by State, place of residence, race, Hispanic origin, and sex: United States, 1980

[Figures in this table may not add to totals because of rounding to nearest hundred]

State	Total			Place of residence				Race and Hispanic origin							
				Urban		Rural		White		Black		Other		Hispanic	
	Both sexes	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total.....	1,456	1,106	350	371	140	736	210	1,011	294	29	18	46	24	20	15
Alabama.....	28	21	7	6	2	16	5	21	6	1	-	-	-	-	-
Alaska.....	2	1	1	-	-	1	-	1	1	-	-	-	-	-	-
Arizona.....	19	14	5	10	3	4	2	13	4	-	-	-	1	1	-
Arkansas.....	14	12	2	3	1	9	2	11	2	-	-	-	-	-	-
California.....	134	102	32	58	20	44	12	76	18	2	2	21	10	3	2
Colorado.....	20	15	5	7	3	8	2	14	4	-	-	-	-	-	1
Connecticut.....	19	15	4	4	1	11	3	14	4	-	-	-	-	-	-
Delaware.....	3	3	1	-	-	2	1	3	1	-	-	-	-	-	-
District of Columbia.....	3	2	1	2	1	-	-	-	-	1	1	-	-	-	-
Florida.....	61	47	14	13	4	34	10	40	8	3	1	1	-	3	4
Georgia.....	39	30	9	3	2	27	7	28	8	1	1	1	-	-	-
Hawaii.....	4	2	2	1	1	1	-	1	1	-	-	1	1	-	-
Idaho.....	6	4	1	-	-	4	1	4	1	-	-	-	-	-	-
Illinois.....	93	59	33	19	12	40	21	52	27	3	3	3	3	1	1
Indiana.....	34	25	9	7	2	18	6	24	8	-	-	-	-	-	-
Iowa.....	21	15	5	5	2	11	3	15	5	-	-	-	-	-	-
Kansas.....	13	10	3	4	1	7	2	10	3	-	-	-	-	-	-
Kentucky.....	22	16	6	3	1	13	4	16	6	-	-	-	-	-	-
Louisiana.....	30	24	6	9	3	15	3	22	6	1	-	-	-	-	-
Maine.....	4	3	1	-	-	3	-	3	1	-	-	-	-	-	-
Maryland.....	27	19	8	4	2	15	6	17	6	1	1	1	1	-	-
Massachusetts.....	43	35	9	13	4	21	5	34	8	1	-	-	-	-	-
Michigan.....	61	45	16	16	7	29	9	44	14	1	1	1	-	-	-
Minnesota.....	26	20	6	4	3	15	4	20	6	-	-	-	-	-	-
Mississippi.....	15	13	2	1	-	12	2	13	2	-	-	-	-	-	-
Missouri.....	33	26	7	7	3	19	4	24	7	1	-	-	-	-	-
Montana.....	4	3	1	1	-	2	1	3	1	-	-	-	-	-	-
Nebraska.....	11	8	3	3	1	5	1	8	2	-	-	-	-	-	-
Nevada.....	7	5	1	2	1	3	1	5	1	-	-	-	-	-	-
New Hampshire.....	5	4	1	1	-	3	1	4	1	-	-	-	-	-	-
New Jersey.....	51	41	10	8	3	34	7	36	7	1	-	3	1	1	1
New Mexico.....	10	8	2	3	1	5	1	6	2	-	-	-	-	2	-
New York.....	111	91	20	40	10	51	10	82	15	2	1	6	2	1	1
North Carolina.....	37	27	10	5	3	22	7	26	9	1	1	-	-	-	-
North Dakota.....	6	4	1	1	1	4	1	4	1	-	-	-	-	-	-
Ohio.....	70	53	17	14	6	39	11	51	16	2	1	-	-	-	-
Oklahoma.....	21	17	4	5	2	12	2	16	4	-	-	1	-	-	-
Oregon.....	19	14	5	3	1	11	3	13	4	-	-	1	-	-	-
Pennsylvania.....	76	58	18	19	7	39	11	56	16	1	1	1	1	-	-
Rhode Island.....	7	5	2	2	1	3	1	5	2	-	-	-	-	-	-
South Carolina.....	22	17	6	2	1	15	5	16	5	1	-	-	-	-	-
South Dakota.....	5	4	1	-	-	3	1	4	1	-	-	-	-	-	-
Tennessee.....	32	23	9	8	4	16	5	23	9	-	-	-	-	-	-
Texas.....	81	61	19	31	12	30	7	52	14	3	2	1	1	5	2
Utah.....	9	7	2	3	1	5	1	7	1	-	-	-	-	-	-
Vermont.....	3	2	1	-	-	2	1	2	1	-	-	-	-	-	-
Virginia.....	30	21	9	7	3	15	6	20	8	1	-	-	-	-	-
Washington.....	28	20	8	6	2	13	6	18	7	-	-	1	1	-	-
West Virginia.....	9	7	2	1	-	6	2	7	2	-	-	-	-	-	-
Wisconsin.....	29	23	6	7	2	17	3	23	6	-	-	-	-	-	-
Wyoming.....	3	2	1	-	-	2	1	2	1	-	-	-	-	-	-

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 7. Number of podiatrists, by State, place of residence, race, Hispanic origin, and sex: United States, 1980

[Figures in this table may not add to totals because of rounding to nearest hundred]

State	Total			Place of residence				Race and Hispanic origin							
				Urban		Rural		White		Black		Other		Hispanic	
	Both sexes	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total.....	78	71	7	28	3	43	4	68	5	2	1	1	-	1	-
Alabama.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arizona.....	1	1	-	1	-	-	-	1	-	-	-	-	-	-	-
Arkansas.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
California.....	10	9	1	5	1	4	-	8	1	1	-	-	-	-	-
Colorado.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Connecticut.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Delaware.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
District of Columbia.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Florida.....	4	3	-	1	-	3	-	3	-	-	-	-	-	-	-
Georgia.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Hawaii.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Idaho.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Illinois.....	5	4	1	2	-	2	-	4	1	-	-	-	-	-	-
Indiana.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Iowa.....	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-
Kansas.....	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-
Kentucky.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Louisiana.....	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Maine.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Maryland.....	2	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Massachusetts.....	4	3	-	1	-	2	-	3	-	-	-	-	-	-	-
Michigan.....	3	3	-	1	-	2	-	3	-	-	-	-	-	-	-
Minnesota.....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Missouri.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Montana.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nebraska.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nevada.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
New Hampshire.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
New Jersey.....	5	5	-	1	-	4	-	5	-	-	-	-	-	-	-
New Mexico.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
New York.....	10	10	1	4	1	6	-	9	-	-	-	-	-	-	-
North Carolina.....	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-
North Dakota.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ohio.....	5	5	-	2	-	3	-	5	-	-	-	-	-	-	-
Oklahoma.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oregon.....	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-
Pennsylvania.....	7	6	1	3	-	4	1	6	1	-	-	-	-	-	-
Rhode Island.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South Carolina.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South Dakota.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tennessee.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Texas.....	2	2	-	1	-	1	-	2	-	-	-	-	-	-	-
Utah.....	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-
Vermont.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Virginia.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Washington.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
West Virginia.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wisconsin.....	2	2	-	-	-	1	-	2	-	-	-	-	-	-	-
Wyoming.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 8. Number of veterinarians, by State, place of residence, race, Hispanic origin, and sex: United States, 1980

(Figures in this table may not add to totals because of rounding to nearest hundred)

State	Total			Place of residence				Race and Hispanic origin							
				Urban		Rural		White		Black		Other		Hispanic	
	Both sexes	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total.....	344	298	46	61	12	237	28	287	42	4	1	4	1	3	1
Alabama.....	6	5	1	1	-	4	-	5	-	1	-	1	-	-	-
Alaska.....	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-
Arizona.....	4	4	-	2	-	2	-	4	-	-	-	-	-	-	-
Arkansas.....	4	4	-	1	-	3	-	3	-	-	-	-	-	-	-
California.....	37	32	6	12	2	20	3	30	5	1	-	1	-	-	-
Colorado.....	7	6	1	2	1	4	-	6	1	-	-	-	-	-	-
Connecticut.....	3	3	-	1	-	3	-	3	-	-	-	-	-	-	-
Delaware.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
District of Columbia.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Florida.....	16	13	3	3	1	10	3	12	3	-	-	-	-	1	1
Georgia.....	8	6	1	-	-	6	1	6	1	-	-	-	-	-	-
Hawaii.....	1	1	-	-	-	1	-	-	-	-	-	-	-	-	-
Idaho.....	3	3	-	-	-	3	-	3	-	-	-	-	-	-	-
Illinois.....	15	13	2	2	1	10	2	12	2	-	-	-	-	-	-
Indiana.....	9	8	1	1	-	7	1	8	1	-	-	-	-	-	-
Iowa.....	12	11	1	1	-	10	1	11	1	-	-	-	-	-	-
Kansas.....	7	6	-	1	-	5	-	6	-	-	-	-	-	-	-
Kentucky.....	6	6	-	1	-	4	-	5	-	-	-	-	-	-	-
Louisiana.....	5	4	1	1	-	3	-	4	1	-	-	-	-	-	-
Maine.....	2	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Maryland.....	7	6	1	1	-	6	1	6	1	-	-	-	-	-	-
Massachusetts.....	6	5	1	1	1	4	1	5	1	-	-	-	-	-	-
Michigan.....	13	11	1	2	-	9	1	11	1	-	-	-	-	-	-
Minnesota.....	8	7	1	1	-	7	1	7	1	-	-	-	-	-	-
Mississippi.....	3	2	-	-	-	2	-	2	-	-	-	-	-	-	-
Missouri.....	9	8	1	1	-	7	1	8	1	-	-	-	-	-	-
Montana.....	2	2	-	-	-	2	-	2	-	-	-	-	-	-	-
Nebraska.....	4	4	-	1	-	4	-	4	-	-	-	-	-	-	-
Nevada.....	2	2	-	1	-	1	-	2	-	-	-	-	-	-	-
New Hampshire.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
New Jersey.....	7	6	1	1	-	6	1	5	1	-	-	-	-	-	-
New Mexico.....	2	2	-	1	-	1	-	2	-	-	-	-	-	-	-
New York.....	17	15	2	3	1	12	2	14	2	-	-	-	-	-	-
North Carolina.....	6	5	1	1	-	4	1	4	1	-	-	-	-	-	-
North Dakota.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Ohio.....	14	12	2	2	1	10	1	12	2	-	-	-	-	-	-
Oklahoma.....	5	5	-	1	-	4	-	5	-	-	-	-	-	-	-
Oregon.....	6	5	1	1	-	4	1	5	1	-	-	-	-	-	-
Pennsylvania.....	14	12	2	2	1	10	2	11	2	-	-	1	-	-	-
Rhode Island.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
South Carolina.....	3	3	-	-	-	2	-	2	-	-	-	-	-	-	-
South Dakota.....	2	2	-	-	-	2	-	2	-	-	-	-	-	-	-
Tennessee.....	6	5	1	1	-	4	-	5	1	-	-	-	-	-	-
Texas.....	22	20	3	7	1	13	1	19	2	-	-	-	-	-	-
Utah.....	2	2	-	-	-	1	-	2	-	-	-	-	-	-	-
Vermont.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Virginia.....	9	7	1	1	-	6	1	7	1	-	-	-	-	-	-
Washington.....	8	8	1	1	-	7	1	7	1	-	-	-	-	-	-
West Virginia.....	2	2	-	-	-	1	-	2	-	-	-	-	-	-	-
Wisconsin.....	10	9	1	1	-	8	1	9	1	-	-	-	-	-	-
Wyoming.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 9. Number of physician assistants, by State, place of residence, race, Hispanic origin, and sex: United States, 1980

[Figures in this table may not add to totals because of rounding to nearest hundred]

State	Total			Place of residence				Race and Hispanic origin							
	Both sexes		Female	Urban		Rural		White		Black		Other		Hispanic	
	Male	Female		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total.....	304	182	122	75	51	107	72	153	95	14	16	4	4	10	7
Alabama.....	8	4	4	1	1	3	3	3	3	-	1	-	-	-	-
Alaska.....	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-
Arizona.....	6	4	2	2	1	2	1	3	1	-	-	-	-	1	-
Arkansas.....	2	1	1	-	-	1	1	1	1	-	-	-	-	-	-
California.....	33	23	10	13	6	10	4	18	7	2	1	-	1	2	1
Colorado.....	5	3	1	2	1	1	1	3	1	-	-	-	-	-	-
Connecticut.....	3	1	2	-	-	1	1	1	2	-	-	-	-	-	-
Delaware.....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
District of Columbia.....	1	1	-	1	-	-	-	-	-	1	-	-	-	-	-
Florida.....	25	15	11	4	4	11	7	13	8	-	2	-	-	1	1
Georgia.....	6	3	3	1	1	3	2	3	2	-	1	-	-	-	-
Hawaii.....	3	1	2	-	1	1	1	1	1	-	-	-	1	-	-
Idaho.....	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-
Illinois.....	18	12	6	6	3	6	3	10	5	1	1	-	-	-	-
Indiana.....	5	3	2	1	-	2	2	3	2	-	-	-	-	-	-
Iowa.....	3	1	1	-	-	1	1	1	1	-	-	-	-	-	-
Kansas.....	3	2	1	1	1	1	-	2	1	-	-	-	-	-	-
Kentucky.....	3	2	1	-	1	1	1	2	1	-	-	-	-	-	-
Louisiana.....	6	1	4	1	2	1	2	1	3	-	1	-	-	-	-
Maine.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Maryland.....	9	6	3	2	-	4	3	4	3	1	1	-	-	-	-
Massachusetts.....	4	2	2	1	1	1	1	2	2	-	-	-	-	-	-
Michigan.....	13	8	5	3	2	4	3	6	4	1	-	-	-	-	-
Minnesota.....	4	3	1	1	1	2	1	3	1	-	-	-	-	-	-
Mississippi.....	2	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Missouri.....	9	6	3	1	1	5	2	6	3	-	-	-	-	-	-
Montana.....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nebraska.....	2	1	1	-	-	1	-	1	1	-	-	-	-	-	-
Nevada.....	3	2	1	1	-	1	-	2	-	-	-	-	-	-	-
New Hampshire.....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
New Jersey.....	7	3	4	1	1	2	3	2	2	-	1	-	-	-	1
New Mexico.....	3	2	1	1	-	1	1	1	1	-	-	-	-	1	-
New York.....	21	11	9	6	6	5	3	8	6	1	2	1	-	1	1
North Carolina.....	7	3	3	1	1	2	2	3	3	-	1	-	-	-	-
North Dakota.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ohio.....	14	9	5	3	2	6	3	8	4	1	1	-	-	-	-
Oklahoma.....	3	2	1	1	1	1	1	1	1	-	-	-	-	-	-
Oregon.....	3	2	1	1	-	2	-	2	1	-	-	-	-	-	-
Pennsylvania.....	14	9	6	4	2	4	3	8	5	1	1	-	-	-	-
Rhode Island.....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South Carolina.....	5	3	3	-	-	3	3	2	2	1	1	-	-	-	-
South Dakota.....	1	1	-	-	-	1	-	-	-	-	-	-	-	-	-
Tennessee.....	6	4	2	2	1	2	1	3	2	-	-	-	-	-	-
Texas.....	18	11	6	5	3	6	3	8	4	1	-	-	-	2	1
Utah.....	2	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Vermont.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Virginia.....	6	3	3	1	1	2	2	2	2	-	-	-	-	-	-
Washington.....	6	4	2	1	1	3	1	4	2	-	-	-	-	-	-
West Virginia.....	3	2	2	-	-	2	2	2	1	-	-	-	-	-	-
Wisconsin.....	4	2	2	1	-	2	1	2	2	-	-	-	-	-	-
Wyoming.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 10. Number of registered nurses, by State, place of residence, race, Hispanic origin, and sex: United States, 1980

[Figures in this table may not add to totals because of rounding to nearest hundred]

State	Total		Place of residence						Race and Hispanic origin							
			Urban		Rural		White		Black		Other		Hispanic			
	Both sexes	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	
Total.....	12,853	528	12,325	238	4,628	290	7,698	426	10,717	54	900	23	459	26	249	
Alabama.....	164	10	154	3	51	6	103	8	129	1	23	-	1	-	1	
Alaska.....	19	1	18	1	10	-	8	1	16	-	-	-	1	-	-	
Arizona.....	151	4	146	3	105	1	42	4	133	-	3	-	5	-	6	
Arkansas.....	78	5	72	3	25	3	47	5	65	-	5	-	2	-	1	
California.....	1,314	69	1,246	42	727	27	518	50	963	6	84	6	134	7	66	
Colorado.....	182	7	174	5	102	3	73	6	162	1	4	-	2	1	6	
Connecticut.....	237	5	232	2	74	3	158	5	222	-	6	-	2	-	2	
Delaware.....	45	1	44	-	5	1	39	1	39	-	3	-	1	-	-	
District of Columbia.....	28	2	26	2	26	-	-	1	10	1	15	-	1	-	-	
Florida.....	547	30	518	9	145	20	373	22	442	3	44	1	14	4	18	
Georgia.....	252	12	241	2	46	9	194	9	194	2	41	-	3	-	2	
Hawaii.....	44	2	43	1	20	1	22	1	21	-	-	-	20	-	1	
Idaho.....	39	2	37	1	9	1	29	2	36	-	-	-	1	-	-	
Illinois.....	734	26	708	12	277	14	431	20	574	3	58	3	66	-	11	
Indiana.....	285	6	279	2	93	3	186	5	261	-	13	-	2	-	2	
Iowa.....	185	6	179	2	61	4	118	6	177	-	1	-	1	-	1	
Kansas.....	143	6	137	3	47	3	90	6	130	-	4	-	1	-	2	
Kentucky.....	150	5	145	1	36	4	108	5	138	-	6	-	-	-	1	
Louisiana.....	152	10	142	5	71	5	72	9	123	1	16	-	1	-	2	
Maine.....	73	3	70	-	8	2	63	3	70	-	-	-	-	-	-	
Maryland.....	290	12	278	3	62	9	216	7	226	3	40	1	9	-	3	
Massachusetts.....	502	15	486	6	175	9	311	15	470	-	10	-	4	-	2	
Michigan.....	478	19	459	7	173	12	286	16	406	2	32	1	16	-	5	
Minnesota.....	298	13	284	6	84	8	200	13	280	-	1	-	2	-	1	
Mississippi.....	88	4	84	1	13	3	71	3	73	1	10	-	1	-	1	
Missouri.....	265	13	252	6	87	8	165	12	222	1	24	-	4	-	2	
Montana.....	41	2	40	-	10	1	30	2	39	-	-	-	-	-	-	
Nebraska.....	103	3	100	1	43	2	58	3	97	-	1	-	1	-	1	
Nevada.....	41	2	38	1	20	1	18	2	33	-	1	-	2	-	1	
New Hampshire.....	70	2	68	-	10	1	58	2	67	-	-	-	-	-	-	
New Jersey.....	486	11	474	3	90	8	384	7	394	2	44	1	27	1	8	
New Mexico.....	55	4	51	2	20	2	30	3	42	-	1	-	2	1	6	
New York.....	1,206	55	1,152	31	560	24	592	36	864	12	191	4	63	2	34	
North Carolina.....	271	10	261	4	71	7	190	9	233	1	25	-	2	-	1	
North Dakota.....	39	1	37	1	7	1	30	1	37	-	-	-	-	-	-	
Ohio.....	637	18	619	7	189	11	430	16	579	2	32	-	5	-	2	
Oklahoma.....	123	7	116	3	53	4	63	6	103	-	6	-	5	-	2	
Oregon.....	148	8	140	2	41	5	99	7	135	-	1	-	3	-	1	
Pennsylvania.....	824	24	800	9	202	15	598	22	758	1	29	-	9	-	4	
Rhode Island.....	67	2	65	1	27	1	38	2	64	-	1	-	-	-	-	
South Carolina.....	143	5	138	1	17	4	121	4	119	1	17	-	1	-	1	
South Dakota.....	41	2	39	-	10	1	30	2	38	-	-	-	-	-	-	
Tennessee.....	216	13	203	6	94	7	109	11	177	2	23	-	2	-	1	
Texas.....	601	35	566	23	339	12	227	26	449	3	52	2	25	5	40	
Utah.....	60	3	57	1	23	1	35	3	56	-	-	-	1	-	1	
Vermont.....	36	1	35	-	-	1	35	1	35	-	-	-	-	-	-	
Virginia.....	290	8	282	3	98	5	184	7	250	1	22	-	7	-	3	
Washington.....	230	10	220	4	70	5	150	9	208	-	3	-	8	-	2	
West Virginia.....	87	4	82	1	8	3	74	4	81	1	1	-	-	-	-	
Wisconsin.....	277	10	267	4	92	6	174	10	261	-	3	-	2	-	1	
Wyoming.....	20	1	19	-	2	1	16	1	18	-	-	-	-	-	-	

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 11. Number of licensed practical nurses, by State, place of residence, race, Hispanic origin, and sex: United States, 1980

[Figures in this table may not add to totals because of rounding to nearest hundred]

State	Total		Place of residence						Race and Hispanic origin							
	Both sexes	Male	Female	Urban		Rural		White		Black		Other		Hispanic		
				Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	
Total	4,352	148	4,204	67	1,456	81	2,748	107	3,225	29	749	5	87	7	143	
Alabama	95	2	92	1	28	1	64	1	62	1	30	-	-	-	-	
Alaska	3	-	2	-	1	-	1	-	2	-	-	-	-	-	-	
Arizona	35	1	33	1	24	-	9	1	27	-	2	-	2	-	3	
Arkansas	63	2	61	1	13	2	48	2	51	-	9	-	-	-	-	
California	383	26	357	16	213	10	144	17	227	4	64	2	30	2	36	
Colorado	42	2	40	1	21	1	20	1	33	-	3	-	1	-	4	
Connecticut	62	1	61	1	22	-	39	1	55	-	5	-	-	-	1	
Delaware	10	-	10	-	2	-	8	-	7	-	3	-	-	-	-	
District of Columbia	10	1	10	1	10	-	-	-	1	-	9	-	-	-	-	
Florida	170	6	164	2	44	4	121	5	123	1	35	-	3	-	4	
Georgia	116	3	113	1	23	3	90	2	68	2	43	-	-	-	1	
Hawaii	16	1	15	-	5	1	10	-	5	-	-	-	8	-	1	
Idaho	18	1	17	-	2	1	15	1	16	-	-	-	-	-	-	
Illinois	184	6	178	2	68	4	110	4	127	1	44	-	3	-	4	
Indiana	79	1	78	-	29	1	49	1	68	1	9	-	-	-	1	
Iowa	64	2	62	1	17	1	45	2	61	-	1	-	-	-	-	
Kansas	43	1	43	-	15	-	28	1	38	-	4	-	1	-	1	
Kentucky	55	1	54	-	8	1	46	1	48	-	5	-	-	-	-	
Louisiana	87	4	84	2	33	2	51	2	56	1	26	-	-	-	1	
Maine	24	1	23	-	1	1	21	1	23	-	-	-	-	-	-	
Maryland	60	4	56	2	15	3	41	2	34	2	20	-	1	-	-	
Massachusetts	133	5	128	2	43	3	85	5	120	-	5	-	1	-	1	
Michigan	205	7	198	3	67	4	131	6	164	1	30	-	2	-	2	
Minnesota	104	1	102	-	20	1	82	1	101	-	-	-	1	-	-	
Mississippi	58	1	57	-	6	1	51	1	40	-	16	-	-	-	-	
Missouri	102	3	98	1	31	2	68	3	78	-	19	-	1	-	1	
Montana	14	-	14	-	3	-	11	-	13	-	-	-	1	-	-	
Nebraska	34	1	33	1	12	-	21	1	31	-	1	-	-	-	1	
Nevada	12	-	12	-	5	-	7	-	10	-	1	-	1	-	-	
New Hampshire	16	-	16	-	3	-	13	-	16	-	-	-	-	-	-	
New Jersey	120	4	115	2	27	2	89	2	82	2	29	-	2	-	3	
New Mexico	20	1	19	-	6	1	13	-	10	-	1	-	2	-	6	
New York	307	12	295	6	128	6	168	7	203	4	73	-	7	-	12	
North Carolina	98	3	95	1	21	2	74	2	68	1	25	-	1	-	1	
North Dakota	17	1	16	-	3	1	13	1	16	-	-	-	-	-	-	
Ohio	248	4	244	2	85	2	159	3	200	1	42	-	1	-	2	
Oklahoma	66	2	64	1	19	1	45	1	53	-	6	-	5	-	1	
Oregon	33	1	32	-	8	1	25	1	30	-	2	-	1	-	-	
Pennsylvania	243	6	237	2	64	4	172	5	198	2	36	-	1	-	1	
Rhode Island	22	-	22	-	10	-	12	-	21	-	-	-	-	-	-	
South Carolina	59	1	58	-	7	1	51	1	36	-	22	-	-	-	-	
South Dakota	13	-	13	-	3	-	10	-	13	-	-	-	-	-	-	
Tennessee	108	2	106	1	36	2	70	2	84	-	21	-	-	-	1	
Texas	339	12	327	8	156	4	171	7	205	2	70	-	4	3	49	
Utah	23	1	22	1	9	-	13	1	21	-	-	-	-	-	-	
Vermont	14	-	13	-	-	-	13	-	13	-	-	-	-	-	-	
Virginia	104	3	101	1	35	2	66	2	71	1	29	-	1	-	1	
Washington	76	4	72	2	20	2	52	3	65	-	3	-	2	-	1	
West Virginia	35	1	34	-	3	1	31	1	32	-	1	-	-	-	-	
Wisconsin	105	2	103	1	35	1	68	2	98	-	4	-	1	-	1	
Wyoming	5	-	5	-	1	-	5	-	5	-	-	-	-	-	-	

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 12. Number of nursing aides, orderlies, and attendants, by State, place of residence, race, Hispanic origin, and sex: United States, 1980
 [Figures in this table may not add to totals because of rounding to nearest hundred]

State	Place of residence							Race and Hispanic origin							
	Total		Urban		Rural			White		Black		Other		Hispanic	
	Both sexes	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total	13,781	1,684	12,098	755	4,410	929	7,687	1,032	7,980	495	3,227	46	285	111	604
Alabama	248	41	207	14	54	27	153	17	107	23	98	-	1	-	2
Alaska	14	1	13	1	4	1	9	1	7	-	1	-	4	-	-
Arizona	109	13	96	9	60	4	35	9	66	1	7	1	9	2	14
Arkansas	162	15	147	6	26	10	121	10	105	5	40	-	1	-	1
California	1,167	174	994	112	566	62	428	99	555	32	196	12	74	31	169
Colorado	126	18	108	12	58	6	50	12	75	2	10	1	3	4	20
Connecticut	215	26	189	12	83	14	106	20	139	5	41	1	2	1	7
Delaware	32	3	29	-	5	2	23	2	15	1	13	-	-	-	-
District of Columbia	48	9	38	9	38	-	-	1	2	8	35	-	-	-	1
Florida	495	66	429	21	135	46	294	36	220	22	177	1	6	7	26
Georgia	292	45	247	11	57	34	191	18	116	26	128	-	2	-	2
Hawaii	26	2	24	1	9	1	14	-	6	-	-	1	16	-	1
Idaho	37	3	35	1	4	2	31	3	32	-	-	-	1	-	1
Illinois	674	66	607	32	219	34	389	41	417	18	154	3	19	4	17
Indiana	363	27	337	11	106	16	231	22	271	5	59	-	2	-	5
Iowa	240	16	223	5	44	11	179	16	215	-	5	-	2	-	1
Kansas	197	16	181	7	44	9	137	12	155	3	18	1	3	1	6
Kentucky	220	22	199	7	41	15	158	17	163	5	34	-	1	-	1
Louisiana	281	33	248	18	105	15	143	14	95	18	147	-	2	-	3
Maine	88	8	80	-	4	7	76	8	79	-	-	-	1	-	1
Maryland	251	36	214	13	83	23	131	16	96	19	113	1	3	1	2
Massachusetts	454	60	394	30	176	30	218	49	340	9	39	1	5	2	10
Michigan	591	73	518	34	200	39	318	51	375	19	127	1	8	2	8
Minnesota	353	41	312	16	71	25	242	37	300	2	5	1	5	1	2
Mississippi	165	21	144	3	18	18	126	9	62	12	81	-	1	-	1
Missouri	372	36	336	15	112	21	224	26	248	9	82	-	3	1	3
Montana	50	5	45	1	5	4	40	4	41	-	-	-	3	-	1
Nebraska	119	10	109	5	28	5	81	9	101	-	4	-	1	-	2
Nevada	25	5	20	3	8	2	12	4	15	1	3	-	2	-	1
New Hampshire	58	6	53	1	9	5	43	6	52	-	-	-	-	-	-
New Jersey	376	41	335	17	118	24	217	14	160	22	154	1	7	4	14
New Mexico	50	8	42	3	8	5	33	3	18	-	2	1	4	5	18
New York	1,283	188	1,094	106	605	82	490	88	530	74	474	5	21	21	70
North Carolina	350	56	294	13	63	43	231	28	168	27	122	1	3	1	2
North Dakota	52	4	47	1	5	3	42	4	44	-	-	-	2	-	-
Ohio	648	67	581	33	214	34	368	45	431	21	139	1	4	1	6
Oklahoma	223	18	206	8	55	10	150	12	152	4	31	2	19	-	4
Oregon	139	17	122	7	28	10	94	15	109	-	4	1	4	1	4
Pennsylvania	697	96	601	34	182	62	419	72	467	21	125	1	5	1	5
Rhode Island	80	12	68	6	29	6	39	11	60	1	6	-	1	-	1
South Carolina	147	21	125	4	14	17	111	9	49	11	74	-	-	-	1
South Dakota	59	4	54	-	6	4	48	3	50	-	-	1	4	-	-
Tennessee	268	41	227	19	84	22	143	27	158	13	67	-	1	1	2
Texas	843	79	763	48	357	32	406	35	346	27	258	1	9	17	150
Utah	51	8	44	4	17	4	27	7	39	-	1	-	1	1	3
Vermont	32	4	28	-	-	4	28	4	27	-	-	-	-	-	-
Virginia	314	50	264	18	89	32	175	28	151	20	106	1	4	1	3
Washington	186	22	164	10	48	12	116	17	139	2	11	2	10	1	4
West Virginia	114	15	100	2	8	13	91	12	91	2	7	-	1	-	-
Wisconsin	375	32	343	12	104	20	239	28	305	3	30	-	4	-	3
Wyoming	20	2	19	-	1	1	17	1	17	-	-	-	1	-	1

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 13. Number of clinical laboratory technologists and technicians, by State, place of residence, race, Hispanic origin, and sex: United States, 1980

[Figures in this table may not add to totals because of rounding to nearest hundred]

State	Total			Place of residence				Race and Hispanic origin							
				Urban		Rural		White		Black		Other		Hispanic	
	Both sexes	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total	2,440	622	1,818	298	782	324	1,036	458	1,454	80	201	45	101	39	62
Alabama	34	9	24	3	9	6	15	8	21	1	3	-	-	-	-
Alaska	2	1	2	1	1	-	1	1	1	-	-	-	-	-	-
Arizona	25	8	18	6	13	2	5	6	15	-	1	-	-	1	2
Arkansas	17	4	13	1	4	3	8	4	12	-	1	-	-	-	-
California	249	86	162	56	104	31	58	55	107	9	11	14	33	8	11
Colorado	33	7	26	4	16	3	10	5	23	-	1	-	-	1	1
Connecticut	31	6	25	3	10	3	14	5	22	-	1	-	-	-	-
Delaware	8	1	7	-	1	1	6	1	5	-	1	-	-	-	-
District of Columbia	8	3	4	3	4	-	-	-	1	2	3	-	-	-	-
Florida	101	30	71	10	23	20	48	20	55	3	6	1	2	6	8
Georgia	63	16	47	4	11	12	36	11	33	5	13	-	1	-	-
Hawaii	8	2	6	2	3	1	4	1	3	-	-	1	3	-	-
Idaho	7	2	5	-	1	1	4	2	5	-	-	-	-	-	-
Illinois	160	38	123	18	54	20	69	24	88	7	21	5	10	2	3
Indiana	52	12	40	6	15	6	24	11	34	1	4	-	-	-	1
Iowa	27	5	22	3	9	2	12	5	21	-	-	-	-	-	-
Kansas	26	5	21	2	10	3	12	5	19	-	2	-	1	-	-
Kentucky	34	7	27	3	9	4	18	6	24	-	2	-	-	-	-
Louisiana	29	11	28	6	17	5	11	8	20	2	6	-	-	1	1
Maine	14	2	12	-	1	2	11	2	12	-	-	-	-	-	-
Maryland	61	19	42	6	12	13	31	12	29	5	9	2	4	-	1
Massachusetts	81	18	63	9	26	9	37	15	59	1	2	1	2	1	1
Michigan	98	24	74	11	36	13	38	20	60	3	10	1	3	-	1
Minnesota	55	10	45	4	16	6	29	9	44	-	-	-	1	-	-
Mississippi	21	5	16	1	4	4	12	4	13	1	3	-	-	-	-
Missouri	61	14	46	6	16	9	30	12	37	1	8	1	1	-	1
Montana	7	1	6	-	2	1	4	1	6	-	-	-	-	-	-
Nebraska	21	4	17	2	10	2	7	4	16	-	-	-	-	-	-
Nevada	7	2	6	1	4	1	2	1	5	-	-	-	-	-	-
New Hampshire	8	2	6	-	1	2	5	2	6	-	-	-	-	-	-
New Jersey	72	16	56	5	14	12	42	10	39	2	7	2	7	1	3
New Mexico	12	4	8	2	4	2	4	2	6	-	-	-	-	1	1
New York	194	60	134	38	71	22	64	33	97	14	20	6	10	7	8
North Carolina	70	18	52	5	15	13	36	13	40	5	11	-	1	-	-
North Dakota	7	1	6	-	1	1	5	1	6	-	-	-	-	-	-
Ohio	116	27	89	13	33	14	56	23	77	3	9	1	2	-	1
Oklahoma	31	8	24	3	12	4	12	7	20	1	2	-	1	-	-
Oregon	25	8	18	2	6	6	11	7	17	-	-	-	1	-	-
Pennsylvania	125	24	101	10	37	15	64	20	90	3	8	1	2	-	1
Rhode Island	12	3	9	2	3	2	5	3	8	-	-	-	-	-	-
South Carolina	27	6	21	2	3	4	18	5	18	1	3	-	-	-	-
South Dakota	8	2	6	-	2	1	4	2	6	-	-	-	-	-	-
Tennessee	54	13	41	6	21	7	20	10	31	2	9	-	-	-	-
Texas	141	39	102	24	65	14	37	27	73	3	14	2	3	6	12
Utah	16	5	11	2	5	2	6	4	10	-	-	-	-	-	-
Vermont	5	1	4	-	-	1	4	1	4	-	-	-	-	-	-
Virginia	52	11	42	5	14	6	27	8	33	2	5	1	3	-	1
Washington	39	9	30	4	12	4	18	7	27	-	1	1	2	-	-
West Virginia	17	3	14	-	1	3	13	3	13	-	-	-	-	-	-
Wisconsin	56	11	46	4	20	6	26	10	44	-	1	-	1	-	1
Wyoming	3	-	3	-	1	-	2	-	3	-	-	-	-	-	-

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 14. Number of dental hygienists, by State, place of residence, race, Hispanic origin, and sex: United States, 1980

[Figures in this table may not add to totals because of rounding to nearest hundred]

State	Total			Place of residence				Race and Hispanic origin							
				Urban		Rural		White		Black		Other		Hispanic	
	Both sexes	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total.....	462	7	455	3	155	4	300	6	436	-	7	1	5	-	7
Alabama.....	11	-	11	-	3	-	8	-	11	-	-	-	-	-	-
Alaska.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Arizona.....	5	-	5	-	4	-	1	-	5	-	-	-	-	-	-
Arkansas.....	3	-	3	-	2	-	1	-	3	-	-	-	-	-	-
California.....	49	1	47	1	23	-	24	1	42	-	-	-	3	-	2
Colorado.....	7	-	7	-	4	-	3	-	7	-	-	-	-	-	-
Connecticut.....	10	-	10	-	3	-	7	-	10	-	-	-	-	-	-
Delaware.....	2	-	2	-	-	-	2	-	2	-	-	-	-	-	-
District of Columbia.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Florida.....	23	-	22	-	6	-	16	-	21	-	-	-	-	-	1
Georgia.....	15	-	14	-	2	-	12	-	14	-	-	-	-	-	-
Hawaii.....	2	-	2	-	1	-	-	-	1	-	-	-	1	-	-
Idaho.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Illinois.....	18	-	18	-	5	-	13	-	18	-	-	-	-	-	-
Indiana.....	9	-	9	-	2	-	6	-	9	-	-	-	-	-	-
Iowa.....	4	-	4	-	1	-	3	-	4	-	-	-	-	-	-
Kansas.....	4	-	4	-	2	-	2	-	4	-	-	-	-	-	-
Kentucky.....	4	-	4	-	1	-	3	-	4	-	-	-	-	-	-
Louisiana.....	5	-	5	-	3	-	2	-	5	-	-	-	-	-	-
Maine.....	3	-	3	-	-	-	3	-	3	-	-	-	-	-	-
Maryland.....	9	-	9	-	2	-	7	-	8	-	1	-	-	-	-
Massachusetts.....	20	-	20	-	6	-	14	-	20	-	-	-	-	-	-
Michigan.....	24	-	24	-	8	-	16	-	24	-	1	-	-	-	-
Minnesota.....	11	-	11	-	4	-	7	-	11	-	-	-	-	-	-
Mississippi.....	2	-	2	-	-	-	1	-	2	-	-	-	-	-	-
Missouri.....	5	-	5	-	2	-	4	-	5	-	-	-	-	-	-
Montana.....	2	-	2	-	-	-	1	-	2	-	-	-	-	-	-
Nebraska.....	3	-	3	-	1	-	1	-	3	-	-	-	-	-	-
Nevada.....	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-
New Hampshire.....	2	-	2	-	-	-	2	-	2	-	-	-	-	-	-
New Jersey.....	14	1	14	-	2	1	12	-	13	-	-	-	-	-	-
New Mexico.....	2	-	2	-	1	-	-	-	1	-	-	-	-	-	-
New York.....	44	-	43	-	16	-	28	-	42	-	1	-	-	-	1
North Carolina.....	15	-	14	-	4	-	11	-	14	-	-	-	-	-	-
North Dakota.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Ohio.....	22	-	21	-	6	-	15	-	21	-	-	-	-	-	-
Oklahoma.....	4	-	4	-	2	-	2	-	4	-	-	-	-	-	-
Oregon.....	6	-	6	-	2	-	4	-	6	-	-	-	-	-	-
Pennsylvania.....	21	-	21	-	5	-	16	-	21	-	-	-	-	-	-
Rhode Island.....	2	-	2	-	1	-	2	-	2	-	-	-	-	-	-
South Carolina.....	5	-	5	-	1	-	5	-	5	-	-	-	-	-	-
South Dakota.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Tennessee.....	7	-	7	-	3	-	4	-	7	-	-	-	-	-	-
Texas.....	23	-	22	-	14	-	9	-	21	-	-	-	-	-	1
Utah.....	1	-	1	-	1	-	1	-	1	-	-	-	-	-	-
Vermont.....	2	-	2	-	-	-	2	-	2	-	-	-	-	-	-
Virginia.....	8	-	7	-	3	-	5	-	7	-	-	-	-	-	-
Washington.....	12	-	12	-	3	-	8	-	11	-	-	-	-	-	-
West Virginia.....	4	-	4	-	-	-	4	-	4	-	-	-	-	-	-
Wisconsin.....	12	-	12	-	4	-	8	-	12	-	-	-	-	-	-
Wyoming.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 15. Number of dental assistants, by State, place of residence, race, Hispanic origin, and sex: United States, 1980

(Figures in this table may not add to totals because of rounding to nearest hundred)

State	Total			Place of residence				Race and Hispanic origin							
				Urban		Rural		White		Black		Other		Hispanic	
	Both sexes	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total	1,581	33	1,548	17	548	16	1,000	25	1,373	4	62	2	31	2	82
Alabama	19	-	18	-	5	-	14	-	17	-	1	-	-	-	-
Alaska	3	-	3	-	2	-	2	-	3	-	-	-	-	-	-
Arizona	18	-	18	-	12	-	6	-	15	-	-	-	1	-	2
Arkansas	11	-	11	-	2	-	8	-	10	-	-	-	-	-	-
California	228	6	222	3	121	2	101	4	189	-	9	1	13	1	31
Colorado	26	1	25	1	14	-	11	1	22	-	-	-	1	-	2
Connecticut	22	-	22	-	7	-	15	-	21	-	-	-	-	-	1
Delaware	4	-	4	-	-	-	4	-	4	-	-	-	-	-	-
District of Columbia	3	-	3	-	3	-	-	-	1	-	2	-	-	-	-
Florida	59	1	58	-	17	1	41	1	48	-	3	-	-	-	7
Georgia	29	1	28	-	5	1	23	1	24	-	3	-	-	-	-
Hawaii	8	-	8	-	4	-	4	-	2	-	-	-	5	-	1
Idaho	9	-	8	-	1	-	7	-	8	-	-	-	-	-	-
Illinois	75	2	73	1	26	1	47	2	64	-	6	-	1	-	3
Indiana	35	1	34	-	10	1	25	1	33	-	1	-	-	-	-
Iowa	22	-	21	-	7	-	15	-	21	-	-	-	-	-	-
Kansas	17	-	17	-	5	-	12	-	16	-	-	-	-	-	-
Kentucky	20	-	20	-	4	-	16	-	20	-	-	-	-	-	-
Louisiana	22	1	22	1	8	-	13	1	20	-	1	-	-	-	1
Maine	5	-	5	-	1	-	4	-	5	-	-	-	-	-	-
Maryland	30	1	29	-	6	-	23	-	26	-	3	-	-	-	-
Massachusetts	42	1	41	-	15	-	26	-	40	-	-	-	-	-	-
Michigan	71	1	69	1	26	1	44	1	65	-	3	-	-	-	1
Minnesota	34	1	33	-	7	-	26	1	33	-	-	-	-	-	-
Mississippi	12	-	12	-	1	-	11	-	11	-	1	-	-	-	-
Missouri	33	1	33	-	8	-	25	-	30	-	2	-	-	-	-
Montana	5	-	5	-	1	-	4	-	5	-	-	-	-	-	-
Nebraska	14	-	13	-	5	-	9	-	13	-	-	-	-	-	-
Nevada	6	-	6	-	3	-	3	-	5	-	-	-	-	-	-
New Hampshire	4	-	4	-	1	-	3	-	4	-	-	-	-	-	-
New Jersey	60	1	59	1	11	-	48	1	54	-	2	-	-	-	2
New Mexico	7	-	7	-	3	-	5	-	4	-	-	-	1	-	2
New York	129	3	127	2	57	-	69	1	107	1	6	-	1	1	12
North Carolina	31	-	31	-	-	-	25	-	28	-	2	-	-	-	-
North Dakota	3	-	3	-	-	-	3	-	3	-	-	-	-	-	-
Ohio	68	1	67	1	21	1	46	1	63	-	3	-	-	-	1
Oklahoma	17	-	17	-	7	-	10	-	15	-	-	-	1	-	-
Oregon	25	-	25	-	5	-	20	-	24	-	-	-	-	-	1
Pennsylvania	71	2	69	1	18	1	51	2	65	-	3	-	-	-	1
Rhode Island	6	-	6	-	3	-	4	-	6	-	-	-	-	-	-
South Carolina	14	1	14	-	1	-	12	-	13	-	1	-	-	-	-
South Dakota	5	-	5	-	1	-	4	-	4	-	-	-	-	-	-
Tennessee	27	1	26	-	9	-	17	-	25	-	1	-	-	-	-
Texas	89	2	87	1	45	1	42	1	71	-	3	-	1	-	12
Utah	13	-	13	-	4	-	9	-	13	-	-	-	-	-	-
Vermont	4	-	4	-	-	-	4	-	4	-	-	-	-	-	-
Virginia	34	1	33	-	10	-	23	1	31	-	2	-	-	-	1
Washington	43	-	43	-	11	-	32	-	40	-	-	-	1	-	1
West Virginia	9	-	9	-	1	-	8	-	9	-	-	-	-	-	-
Wisconsin	36	1	36	-	10	1	26	1	35	-	-	-	-	-	-
Wyoming	3	-	3	-	-	-	2	-	3	-	-	-	-	-	-

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 16. Number of dietitians, by State, place of residence, race, Hispanic origin, and sex: United States, 1980

[Figures in this table may not add to totals because of rounding to nearest hundred]

State	Total			Place of residence				Race and Hispanic origin							
	Both sexes	Male	Female	Urban		Rural		White		Black		Other		Hispanic	
				Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total.....	673	68	605	34	249	34	356	42	433	19	125	2	26	4	21
Alabama.....	13	1	12	-	4	-	8	-	7	-	5	-	-	-	-
Alaska.....	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-
Arizona.....	8	1	7	1	4	-	2	1	5	-	-	-	-	-	-
Arkansas.....	6	1	5	-	1	-	4	-	4	-	1	-	-	-	-
California.....	63	10	53	6	31	4	22	5	37	2	6	1	6	1	5
Colorado.....	8	1	7	-	4	-	3	-	5	-	1	-	-	-	1
Connecticut.....	9	1	8	1	4	-	4	1	7	-	1	-	-	-	-
Delaware.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
District of Columbia.....	4	-	3	-	3	-	-	-	-	-	3	-	-	-	-
Florida.....	21	2	19	1	7	1	12	1	11	1	6	-	-	-	1
Georgia.....	17	2	15	-	3	1	12	1	10	1	5	-	-	-	-
Hawaii.....	1	-	1	-	1	-	1	-	-	-	-	-	1	-	-
Idaho.....	3	-	2	-	-	-	2	-	2	-	-	-	-	-	-
Illinois.....	37	5	32	3	15	2	18	3	23	2	5	-	3	-	1
Indiana.....	15	1	14	1	6	-	8	1	11	1	3	-	-	-	-
Iowa.....	11	1	11	-	3	1	8	1	10	-	-	-	-	-	-
Kansas.....	7	1	7	-	2	-	4	-	6	-	1	-	-	-	-
Kentucky.....	11	1	10	-	3	-	7	1	8	-	2	-	-	-	-
Louisiana.....	15	1	14	1	5	1	9	1	6	1	8	-	-	-	-
Maine.....	3	-	3	-	-	-	2	-	3	-	-	-	-	-	-
Maryland.....	16	2	14	1	4	1	10	1	7	1	6	-	1	-	-
Massachusetts.....	24	3	22	2	12	1	10	2	19	-	2	-	1	-	1
Michigan.....	23	1	22	1	10	1	12	1	18	-	4	-	1	-	-
Minnesota.....	12	1	11	-	2	1	9	1	11	-	-	-	-	-	-
Mississippi.....	8	1	7	-	1	1	7	-	4	-	3	-	-	-	-
Missouri.....	14	1	13	-	4	1	9	1	11	-	2	-	-	-	-
Montana.....	3	-	2	-	-	-	2	-	2	-	-	-	-	-	-
Nebraska.....	6	-	6	-	3	-	3	-	5	-	-	-	-	-	-
Nevada.....	2	-	2	-	1	-	1	-	1	-	-	-	-	-	-
New Hampshire.....	2	-	2	-	-	-	1	-	2	-	-	-	-	-	-
New Jersey.....	22	2	20	1	6	1	15	1	13	1	5	-	2	-	1
New Mexico.....	3	1	3	-	1	-	1	-	1	-	-	-	-	-	1
New York.....	61	8	53	5	30	3	24	4	32	3	15	-	5	1	2
North Carolina.....	21	2	19	1	5	1	13	1	10	1	8	-	1	-	-
North Dakota.....	3	-	3	-	1	-	2	-	3	-	-	-	-	-	-
Ohio.....	36	2	34	1	15	1	19	2	26	1	7	-	1	-	-
Oklahoma.....	9	1	8	-	3	-	5	1	6	-	1	-	1	-	-
Oregon.....	6	1	5	-	2	-	4	1	5	-	-	-	-	-	-
Pennsylvania.....	33	3	30	1	10	2	19	2	24	1	5	-	-	-	1
Rhode Island.....	3	-	2	-	1	-	2	-	2	-	-	-	-	-	-
South Carolina.....	10	1	9	-	2	-	7	-	5	-	4	-	-	-	-
South Dakota.....	3	-	2	-	-	-	2	-	2	-	-	-	-	-	-
Tennessee.....	15	2	14	1	6	1	7	1	10	1	3	-	-	-	-
Texas.....	36	2	34	1	21	1	13	1	21	1	8	-	1	-	4
Utah.....	3	-	3	-	1	-	2	-	3	-	-	-	-	-	-
Vermont.....	2	-	2	-	-	-	2	-	2	-	-	-	-	-	-
Virginia.....	14	1	13	1	5	-	8	-	8	-	4	-	-	-	-
Washington.....	9	1	8	-	3	-	5	-	7	-	-	-	-	-	-
West Virginia.....	6	-	5	-	-	-	5	-	5	-	-	-	-	-	-
Wisconsin.....	13	1	12	1	4	1	8	1	11	-	-	-	-	-	-
Wyoming.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 17. Number of health record technologists and technicians, by State, place of residence, race, Hispanic origin, and sex: United States, 1980

[Figures in this table may not add to totals because of rounding to nearest hundred]

State	Total			Place of residence				Race and Hispanic origin							
	Both sexes	Total		Urban		Rural		White		Black		Other		Hispanic	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total.....	151	13	138	6	57	7	81	9	115	2	13	1	6	1	5
Alabama.....	3	-	3	-	1	-	2	-	2	-	-	-	-	-	-
Alaska.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arizona.....	4	-	3	-	2	-	2	-	2	-	-	-	1	-	1
Arkansas.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
California.....	18	2	16	1	11	1	5	1	11	-	1	-	2	-	1
Colorado.....	3	-	3	-	2	-	1	-	3	-	-	-	-	-	-
Connecticut.....	2	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Delaware.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
District of Columbia.....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Florida.....	7	1	6	-	2	1	4	1	5	-	1	-	-	-	-
Georgia.....	3	-	3	-	-	-	2	-	2	-	-	-	-	-	-
Hawaii.....	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Idaho.....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Illinois.....	8	1	7	-	2	-	5	-	6	-	1	-	-	-	-
Indiana.....	3	-	2	-	1	-	2	-	2	-	-	-	-	-	-
Iowa.....	2	-	2	-	1	-	1	-	2	-	-	-	-	-	-
Kansas.....	2	-	2	-	1	-	1	-	2	-	-	-	-	-	-
Kentucky.....	2	-	2	-	1	-	1	-	2	-	-	-	-	-	-
Louisiana.....	3	-	3	-	1	-	2	-	2	-	1	-	-	-	-
Maine.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Maryland.....	4	-	4	-	2	-	2	-	2	-	1	-	-	-	-
Massachusetts.....	4	-	4	-	2	-	2	-	4	-	-	-	-	-	-
Michigan.....	7	-	7	-	3	-	4	-	6	-	1	-	-	-	-
Minnesota.....	4	-	3	-	1	-	2	-	3	-	-	-	-	-	-
Mississippi.....	2	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Missouri.....	4	1	3	-	2	-	2	-	3	-	1	-	-	-	-
Montana.....	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-
Nebraska.....	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-
Nevada.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
New Hampshire.....	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-
New Jersey.....	4	-	4	-	1	-	3	-	3	-	1	-	-	-	-
New Mexico.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
New York.....	11	1	9	1	5	-	5	1	7	-	1	-	1	-	1
North Carolina.....	3	-	3	-	1	-	2	-	2	-	-	-	-	-	-
North Dakota.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Ohio.....	7	-	6	-	3	-	4	-	6	-	1	-	-	-	-
Oklahoma.....	2	-	2	-	1	-	1	-	2	-	-	-	-	-	-
Oregon.....	2	-	2	-	-	-	1	-	2	-	-	-	-	-	-
Pennsylvania.....	4	-	4	-	1	-	3	-	3	-	-	-	-	-	-
Rhode Island.....	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
South Carolina.....	2	-	2	-	1	-	2	-	2	-	-	-	-	-	-
South Dakota.....	1	-	1	-	-	-	1	-	-	-	-	-	-	-	-
Tennessee.....	3	-	3	-	2	-	2	-	3	-	-	-	-	-	-
Texas.....	8	1	7	1	3	-	3	1	5	-	1	-	-	-	1
Utah.....	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-
Vermont.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Virginia.....	3	-	3	-	1	-	2	-	3	-	-	-	-	-	-
Washington.....	3	-	2	-	1	-	2	-	2	-	-	-	-	-	-
West Virginia.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Wisconsin.....	4	-	4	-	1	-	2	-	3	-	-	-	-	-	-
Wyoming.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 12. Number of occupational therapists, by State, place of residence, race, Hispanic origin, and sex: United States, 1980

[Figures in this table may not add to totals because of rounding to nearest hundred]

State	Total			Place of residence				Race and Hispanic origin							
				Urban		Rural		White		Black		Other		Hispanic	
	Both sexes	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total.....	178	15	163	6	72	9	91	12	150	2	6	1	4	1	3
Alabama.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Alaska.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arizona.....	2	-	2	-	1	-	-	-	2	-	-	-	-	-	-
Arkansas.....	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-
California.....	19	1	18	1	11	-	7	1	15	-	-	-	2	-	-
Colorado.....	4	-	3	-	2	-	1	-	3	-	-	-	-	-	-
Connecticut.....	2	-	2	-	-	-	2	-	2	-	-	-	-	-	-
Delaware.....	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-
District of Columbia.....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Florida.....	5	1	4	-	2	-	2	-	4	-	-	-	-	-	-
Georgia.....	2	-	2	-	-	-	2	-	2	-	-	-	-	-	-
Hawaii.....	1	-	1	-	-	-	-	-	-	-	-	-	1	-	-
Idaho.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Illinois.....	9	1	8	-	4	-	4	1	7	-	-	-	-	-	-
Indiana.....	4	-	4	-	2	-	2	-	4	-	-	-	-	-	-
Iowa.....	2	-	2	-	1	-	1	-	2	-	-	-	-	-	-
Kansas.....	2	-	2	-	1	-	1	-	2	-	-	-	-	-	-
Kentucky.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Louisiana.....	2	-	2	-	1	-	1	-	1	-	-	-	-	-	-
Maine.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Maryland.....	3	-	3	-	1	-	2	-	3	-	-	-	-	-	-
Massachusetts.....	10	-	10	-	4	-	6	-	10	-	-	-	-	-	-
Michigan.....	10	1	9	-	4	-	6	-	9	-	-	-	-	-	-
Minnesota.....	7	1	6	-	3	-	4	1	6	-	-	-	-	-	-
Mississippi.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Missouri.....	4	-	4	-	2	-	2	-	4	-	-	-	-	-	-
Montana.....	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-
Nebraska.....	1	-	1	-	1	-	-	-	1	-	-	-	-	-	-
Nevada.....	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-
New Hampshire.....	2	-	2	-	-	-	1	-	1	-	-	-	-	-	-
New Jersey.....	5	-	5	-	1	-	4	-	4	-	1	-	-	-	-
New Mexico.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
New York.....	20	3	17	1	8	2	9	2	16	-	1	-	-	-	-
North Carolina.....	2	-	2	-	-	-	1	-	2	-	-	-	-	-	-
North Dakota.....	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-
Ohio.....	7	-	7	-	3	-	3	-	6	-	-	-	-	-	-
Oklahoma.....	1	-	1	-	1	-	1	-	1	-	-	-	-	-	-
Oregon.....	2	-	2	-	1	-	1	-	2	-	-	-	-	-	-
Pennsylvania.....	10	1	9	-	3	1	6	1	9	-	-	-	-	-	-
Rhode Island.....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South Carolina.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
South Dakota.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tennessee.....	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-
Texas.....	9	1	9	-	6	-	3	-	7	-	1	-	-	-	1
Utah.....	1	-	1	-	1	-	-	-	1	-	-	-	-	-	-
Vermont.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Virginia.....	3	-	3	-	1	-	2	-	2	-	-	-	-	-	-
Washington.....	5	-	5	-	2	-	3	-	4	-	-	-	-	-	-
West Virginia.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wisconsin.....	8	1	8	-	4	-	4	1	8	-	-	-	-	-	-
Wyoming.....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 19. Number of physical therapists, by State, place of residence, race, Hispanic origin, and sex: United States, 1980

[Figures in this table may not add to totals because of rounding to nearest hundred]

State	Total			Place of residence				Race and Hispanic origin							
				Urban		Rural		White		Black		Other		Hispanic	
	Both sexes	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total.....	431	112	318	44	130	68	189	96	282	10	19	3	8	4	9
Alabama.....	5	1	4	-	2	1	2	1	3	-	1	-	-	-	-
Alaska.....	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-
Arizona.....	5	1	4	1	3	1	1	1	4	-	-	-	-	-	-
Arkansas.....	2	1	2	-	-	-	1	1	2	-	-	-	-	-	-
California.....	59	18	41	11	24	7	17	14	34	1	1	1	3	2	2
Colorado.....	8	1	7	1	4	1	3	1	7	-	-	-	-	-	-
Connecticut.....	10	2	9	1	2	1	6	2	8	-	-	-	-	-	-
Delaware.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
District of Columbia.....	1	-	1	-	1	-	-	-	-	-	1	-	-	-	-
Florida.....	18	6	13	2	4	4	8	5	10	1	1	-	-	1	1
Georgia.....	7	2	6	-	1	1	5	1	4	-	1	-	-	-	-
Hawaii.....	1	-	1	-	1	-	-	-	1	-	-	-	-	-	-
Idaho.....	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-
Illinois.....	21	5	16	2	6	3	10	4	14	-	1	-	-	-	-
Indiana.....	7	2	5	1	3	1	3	2	5	-	-	-	-	-	-
Iowa.....	5	2	3	1	1	1	2	2	3	-	-	-	-	-	-
Kansas.....	5	1	5	-	2	-	3	1	5	-	-	-	-	-	-
Kentucky.....	3	1	3	-	1	-	2	1	3	-	-	-	-	-	-
Louisiana.....	4	2	3	1	2	1	1	1	2	-	-	-	-	-	-
Maine.....	3	1	2	-	-	1	2	1	2	-	-	-	-	-	-
Maryland.....	9	3	6	1	2	2	5	2	6	-	1	-	-	-	-
Massachusetts.....	20	3	17	1	7	1	11	3	17	-	-	-	-	-	-
Michigan.....	16	4	12	2	4	2	7	4	11	-	-	-	-	-	-
Minnesota.....	10	3	7	1	2	2	5	3	7	-	-	-	-	-	-
Mississippi.....	2	1	2	-	-	1	1	1	1	-	-	-	-	-	-
Missouri.....	9	2	7	1	3	1	4	2	6	-	-	-	-	-	-
Montana.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Nebraska.....	2	-	2	-	1	-	1	-	2	-	-	-	-	-	-
Nevada.....	1	1	1	-	-	-	-	-	1	-	-	-	-	-	-
New Hampshire.....	2	-	2	-	-	-	2	-	2	-	-	-	-	-	-
New Jersey.....	13	4	9	1	1	3	8	3	8	-	1	-	-	-	-
New Mexico.....	2	1	2	-	1	1	1	-	2	-	-	-	-	-	-
New York.....	37	10	27	4	13	6	14	8	23	1	3	-	1	-	1
North Carolina.....	10	2	7	-	2	2	5	2	7	-	1	-	-	-	-
North Dakota.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Ohio.....	17	5	13	1	4	3	8	4	11	1	1	-	-	-	-
Oklahoma.....	6	2	4	1	2	1	1	1	3	-	-	-	-	-	-
Oregon.....	5	2	4	-	1	1	3	2	3	-	-	-	-	-	-
Pennsylvania.....	23	8	15	2	4	6	11	8	14	-	1	-	-	-	-
Rhode Island.....	2	-	2	-	1	-	1	-	1	-	-	-	-	-	-
South Carolina.....	4	1	3	-	1	1	2	-	3	-	-	-	-	-	-
South Dakota.....	1	1	1	-	-	-	-	1	1	-	-	-	-	-	-
Tennessee.....	7	2	5	1	2	1	3	2	4	1	1	-	-	-	-
Texas.....	24	5	18	3	11	2	7	4	15	1	2	-	-	-	1
Utah.....	2	2	1	1	-	1	-	2	1	-	-	-	-	-	-
Vermont.....	2	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Virginia.....	8	2	6	1	3	1	4	1	5	-	1	-	-	-	-
Washington.....	9	2	7	1	2	2	4	2	6	-	-	-	-	-	-
West Virginia.....	2	-	2	-	-	-	1	-	2	-	-	-	-	-	-
Wisconsin.....	11	2	9	1	4	1	5	2	9	-	-	-	-	-	-
Wyoming.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 20. Number of radiologic technicians, by State, place of residence, race, Hispanic origin, and sex: United States, 1980
 [Figures in this table may not add to totals because of rounding to nearest hundred]

State	Total			Place of residence				Race and Hispanic origin							
				Urban		Rural		White		Black		Other		Hispanic	
	Both sexes	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total.....	963	274	690	115	283	158	426	211	610	29	50	14	10	21	19
Alabama.....	16	5	10	1	4	4	6	5	9	-	1	-	-	-	-
Alaska.....	1	1	1	-	-	-	-	-	1	-	-	-	-	-	-
Arizona.....	10	4	6	2	4	1	2	3	6	-	-	-	-	-	-
Arkansas.....	8	2	6	1	2	2	4	2	6	-	-	-	-	-	-
California.....	104	42	62	25	37	17	24	28	49	3	5	5	4	6	4
Colorado.....	11	2	9	1	5	1	4	2	8	-	-	-	-	-	-
Connecticut.....	16	2	13	1	4	1	9	2	13	-	-	-	-	-	-
Delaware.....	3	1	2	-	-	1	2	1	2	-	-	-	-	-	-
District of Columbia.....	2	1	1	1	1	-	-	-	-	1	1	-	-	-	-
Florida.....	42	14	28	3	9	10	19	10	24	2	2	-	-	2	2
Georgia.....	21	5	16	1	3	4	12	4	14	-	2	-	-	-	-
Hawaii.....	3	1	2	1	1	1	1	-	1	-	-	1	1	-	-
Idaho.....	4	1	3	-	1	1	2	1	3	-	-	-	-	-	-
Illinois.....	55	16	39	7	15	9	24	10	33	3	4	2	1	-	1
Indiana.....	23	5	18	2	6	3	12	5	17	-	1	-	-	-	-
Iowa.....	10	1	9	1	4	1	5	1	9	-	-	-	-	-	-
Kansas.....	13	2	10	1	5	1	5	2	9	-	-	-	-	-	-
Kentucky.....	13	3	10	1	2	2	7	3	9	-	1	-	-	-	-
Louisiana.....	19	7	12	3	7	4	5	5	10	2	2	-	-	-	-
Maine.....	5	1	4	-	-	1	4	1	4	-	-	-	-	-	-
Maryland.....	19	5	14	1	4	4	10	4	12	1	2	-	-	-	-
Massachusetts.....	31	6	24	3	9	4	16	6	23	-	-	-	-	-	-
Michigan.....	42	12	30	5	14	7	16	10	26	2	4	-	-	-	-
Minnesota.....	20	3	16	1	5	2	11	3	16	-	-	-	-	-	-
Mississippi.....	9	3	6	1	1	3	5	3	5	-	1	-	-	-	-
Missouri.....	20	6	14	3	5	3	9	5	12	1	2	-	-	-	-
Montana.....	3	1	2	-	1	1	1	1	2	-	-	-	-	-	-
Nebraska.....	8	1	6	-	2	1	4	1	6	-	-	-	-	-	-
Nevada.....	3	1	2	1	1	-	1	1	2	-	-	-	-	-	-
New Hampshire.....	4	1	4	-	1	-	3	1	4	-	-	-	-	-	-
New Jersey.....	30	9	21	2	4	7	17	7	19	1	2	1	-	-	1
New Mexico.....	5	2	3	-	1	2	1	1	2	-	-	-	-	1	-
New York.....	69	28	42	17	18	10	23	18	33	5	5	1	-	3	3
North Carolina.....	23	4	19	1	5	3	14	3	17	1	1	-	-	-	-
North Dakota.....	3	1	2	-	-	1	2	1	2	-	-	-	-	-	-
Ohio.....	51	10	41	4	12	6	29	8	39	1	2	-	-	-	-
Oklahoma.....	14	4	9	2	4	3	5	4	8	-	1	-	-	-	-
Oregon.....	11	3	8	1	2	2	6	2	8	-	-	-	-	-	-
Pennsylvania.....	54	12	42	3	15	9	28	10	38	1	4	1	-	-	-
Rhode Island.....	6	1	5	-	2	1	3	1	5	-	-	-	-	-	-
South Carolina.....	11	3	8	-	1	2	7	2	8	-	-	-	-	-	-
South Dakota.....	2	1	2	-	-	-	2	1	2	-	-	-	-	-	-
Tennessee.....	17	5	12	2	5	4	7	5	11	-	1	-	-	-	-
Texas.....	53	18	35	11	20	7	15	10	26	2	4	1	-	5	5
Utah.....	5	1	4	-	2	1	2	1	4	-	-	-	-	-	-
Vermont.....	2	-	2	-	-	-	2	-	2	-	-	-	-	-	-
Virginia.....	21	5	17	1	5	3	11	4	15	1	2	-	-	-	-
Washington.....	18	6	12	2	4	4	8	5	12	-	-	-	-	-	-
West Virginia.....	7	2	5	-	1	2	5	2	5	-	-	-	-	-	-
Wisconsin.....	25	4	21	2	9	3	12	4	21	-	-	-	-	-	-
Wyoming.....	2	-	2	-	-	-	1	-	2	-	-	-	-	-	-

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 21. Number of inhalation therapists, by State, place of residence, race, Hispanic origin, and sex: United States, 1980

[Figures in this table may not add to totals because of rounding to nearest hundred]

State	Total			Place of residence				Race and Hispanic origin							
				Urban		Rural		White		Black		Other		Hispanic	
	Both sexes	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total.....	487	212	276	99	112	113	163	169	229	21	30	6	6	15	11
Alabama.....	8	3	6	1	2	2	4	3	4	-	1	-	-	-	-
Alaska.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arizona.....	6	3	3	2	3	1	1	2	3	-	-	-	-	-	-
Arkansas.....	5	2	3	1	1	1	2	2	3	-	-	-	-	-	-
California.....	60	32	29	20	17	12	11	21	21	4	3	2	2	4	3
Colorado.....	6	3	3	2	2	1	1	2	3	-	-	-	-	1	-
Connecticut.....	7	3	4	2	2	1	3	3	4	-	-	-	-	-	-
Delaware.....	1	1	1	-	-	-	-	1	1	-	-	-	-	-	-
District of Columbia.....	1	1	-	1	-	-	-	1	-	-	-	-	-	-	-
Florida.....	24	13	11	5	3	8	8	10	10	1	-	-	-	2	1
Georgia.....	11	5	6	1	1	3	5	4	5	1	1	-	-	-	-
Hawaii.....	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-
Idaho.....	2	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Illinois.....	26	9	17	5	8	4	9	6	12	1	3	1	1	-	-
Indiana.....	15	5	10	2	4	3	6	5	9	-	1	-	-	-	-
Iowa.....	6	2	4	1	2	1	2	2	4	-	-	-	-	-	-
Kansas.....	6	2	3	1	1	2	2	2	3	-	-	-	-	-	-
Kentucky.....	8	3	5	1	1	3	4	3	5	-	-	-	-	-	-
Louisiana.....	9	3	6	1	3	2	3	2	5	1	1	-	-	-	-
Maine.....	3	1	1	-	-	1	1	1	1	-	-	-	-	-	-
Maryland.....	9	5	4	2	1	3	3	3	2	1	1	-	-	-	-
Massachusetts.....	15	7	8	3	3	5	5	7	8	-	-	-	-	-	-
Michigan.....	25	11	14	4	7	7	8	10	12	1	2	-	-	-	-
Minnesota.....	6	2	4	1	1	1	3	2	4	-	-	-	-	-	-
Mississippi.....	4	2	2	-	-	2	2	2	2	-	-	-	-	-	-
Missouri.....	13	5	8	2	2	3	6	5	7	-	1	-	-	-	-
Montana.....	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-
Nebraska.....	3	2	2	1	1	1	1	1	1	-	-	-	-	-	-
Nevada.....	2	1	1	1	1	-	1	1	1	-	-	-	-	-	-
New Hampshire.....	2	1	1	-	-	1	1	1	1	-	-	-	-	-	-
New Jersey.....	10	5	5	1	1	4	4	5	4	-	1	-	-	-	-
New Mexico.....	2	1	1	-	-	1	-	1	1	-	-	-	-	-	-
New York.....	25	14	11	8	4	6	7	10	9	3	1	-	-	1	1
North Carolina.....	9	4	5	1	1	3	4	3	4	-	1	-	-	-	-
North Dakota.....	1	1	1	-	-	1	1	1	1	-	-	-	-	-	-
Ohio.....	28	11	17	5	7	6	10	10	15	1	2	-	-	-	-
Oklahoma.....	6	2	5	1	1	1	4	1	4	-	-	-	-	-	-
Oregon.....	5	3	2	1	1	2	1	3	2	-	-	-	-	-	-
Pennsylvania.....	23	10	13	4	6	6	8	8	12	1	1	-	-	-	-
Rhode Island.....	2	1	1	1	1	-	1	1	1	-	-	-	-	-	-
South Carolina.....	5	1	3	-	-	1	3	1	3	-	1	-	-	-	-
South Dakota.....	2	-	2	-	1	-	1	-	2	-	-	-	-	-	-
Tennessee.....	12	4	8	1	3	3	5	4	7	1	1	-	-	-	-
Texas.....	38	16	23	11	14	5	9	9	15	2	4	-	-	5	4
Utah.....	3	1	2	-	1	-	1	1	2	-	-	-	-	-	-
Vermont.....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Virginia.....	9	4	5	1	2	2	3	3	4	-	1	-	-	-	-
Washington.....	7	3	5	-	1	2	3	3	4	-	-	-	-	-	-
West Virginia.....	4	1	2	-	-	1	2	1	2	-	-	-	-	-	-
Wisconsin.....	8	3	6	1	2	1	3	2	5	-	-	-	-	-	-
Wyoming.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 22. Number of speech therapists, by State, place of residence, race, Hispanic origin, and sex: United States, 1980

[Figures in this table may not add to totals because of rounding to nearest hundred]

State	Total			Place of residence				Race and Hispanic origin							
				Urban		Rural		White		Black		Other		Hispanic	
	Both sexes	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total.....	413	45	368	17	133	28	235	42	339	2	19	1	4	1	6
Alabama.....	6	1	5	-	2	-	3	-	4	-	1	-	-	-	-
Alaska.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arizona.....	3	1	3	-	2	-	1	-	2	-	-	-	-	-	-
Arkansas.....	5	-	5	-	1	-	4	-	4	-	-	-	-	-	-
California.....	44	5	39	2	22	2	17	4	35	-	2	-	2	-	2
Colorado.....	6	1	5	-	3	-	2	1	5	-	-	-	-	-	-
Connecticut.....	7	1	6	-	1	-	5	1	6	-	-	-	-	-	-
Delaware.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
District of Columbia.....	2	-	1	-	1	-	-	-	1	-	-	-	-	-	-
Florida.....	13	2	11	1	4	1	7	2	10	-	1	-	-	-	-
Georgia.....	6	1	6	-	1	1	5	1	5	-	1	-	-	-	-
Hawaii.....	2	-	1	-	1	-	1	-	-	-	-	-	1	-	-
Idaho.....	2	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Illinois.....	22	2	21	1	8	1	13	1	18	-	2	-	-	-	-
Indiana.....	9	1	9	-	3	-	6	1	8	-	-	-	-	-	-
Iowa.....	6	1	5	1	2	1	3	1	5	-	-	-	-	-	-
Kansas.....	4	1	3	-	1	-	3	1	3	-	-	-	-	-	-
Kentucky.....	4	-	4	-	1	-	4	-	4	-	-	-	-	-	-
Louisiana.....	8	-	7	-	4	-	3	-	6	-	1	-	-	-	-
Maine.....	3	-	2	-	-	-	2	-	2	-	-	-	-	-	-
Maryland.....	8	1	8	-	2	1	6	1	7	-	1	-	-	-	-
Massachusetts.....	15	1	14	1	6	1	8	1	13	-	-	-	-	-	-
Michigan.....	15	2	12	-	4	2	9	2	11	-	1	-	-	-	-
Minnesota.....	7	1	6	1	2	1	4	1	6	-	-	-	-	-	-
Mississippi.....	3	-	3	-	-	-	3	-	2	-	-	-	-	-	-
Missouri.....	10	1	9	-	2	1	7	1	8	-	-	-	-	-	-
Montana.....	2	-	2	-	-	-	1	-	2	-	-	-	-	-	-
Nebraska.....	3	1	3	-	1	-	2	1	3	-	-	-	-	-	-
Nevada.....	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-
New Hampshire.....	2	-	2	-	-	-	2	-	2	-	-	-	-	-	-
New Jersey.....	18	2	16	-	3	1	13	2	15	-	1	-	-	-	-
New Mexico.....	2	-	2	-	1	-	1	-	1	-	-	-	-	-	-
New York.....	39	4	35	2	14	2	21	4	34	-	1	-	-	-	1
North Carolina.....	7	1	7	-	2	-	5	1	6	-	-	-	-	-	-
North Dakota.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Ohio.....	21	2	19	1	6	1	13	2	18	-	1	-	-	-	-
Oklahoma.....	6	-	5	-	2	-	3	-	5	-	-	-	-	-	-
Oregon.....	5	1	4	-	1	1	3	1	4	-	-	-	-	-	-
Pennsylvania.....	26	4	22	-	5	3	17	4	21	-	1	-	-	-	-
Rhode Island.....	2	-	2	-	1	-	1	-	2	-	-	-	-	-	-
South Carolina.....	5	-	4	-	1	-	4	-	4	-	1	-	-	-	-
South Dakota.....	2	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Tennessee.....	7	1	6	-	3	-	3	1	5	-	1	-	-	-	-
Texas.....	22	2	20	1	12	1	8	2	18	-	1	-	-	-	2
Utah.....	2	-	2	-	1	-	1	-	2	-	-	-	-	-	-
Vermont.....	2	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Virginia.....	8	1	7	-	2	1	5	1	7	-	-	-	-	-	-
Washington.....	6	1	5	-	2	1	4	1	5	-	-	-	-	-	-
West Virginia.....	4	-	3	-	-	-	3	-	3	-	-	-	-	-	-
Wisconsin.....	8	1	8	-	3	-	5	1	8	-	-	-	-	-	-
Wyoming.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 23. Number of health diagnosing practitioners, n.e.c., by State, place of residence, race, Hispanic origin, and sex: United States, 1960

[Figures in this table may not add to totals because of rounding to nearest hundred]

State	Total			Place of residence				Race and Hispanic origin							
				Urban		Rural		White		Black		Other		Hispanic	
	Both sexes	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total.....	215	189	27	58	10	130	17	180	24	2	1	5	1	2	1
Alabama.....	3	2	-	1	-	2	-	2	-	-	-	-	-	-	-
Alaska.....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arizona.....	4	3	1	2	-	1	-	3	1	-	-	-	-	-	-
Arkansas.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
California.....	38	31	7	16	4	15	3	27	5	-	-	3	1	1	1
Colorado.....	4	4	-	2	-	2	-	4	-	-	-	-	-	-	-
Connecticut.....	2	2	-	1	-	1	-	2	-	-	-	-	-	-	-
Delaware.....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
District of Columbia.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Florida.....	11	10	1	2	-	8	1	9	1	-	-	-	-	-	-
Georgia.....	4	4	1	1	-	3	-	4	-	-	-	-	-	-	-
Hawaii.....	1	1	-	1	-	-	-	-	-	-	-	1	-	-	-
Idaho.....	2	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Illinois.....	10	9	1	2	-	7	1	9	1	-	-	-	-	-	-
Indiana.....	4	3	1	1	-	2	-	3	1	-	-	-	-	-	-
Iowa.....	5	5	-	1	-	4	-	5	-	-	-	-	-	-	-
Kansas.....	4	4	-	1	-	3	-	4	-	-	-	-	-	-	-
Kentucky.....	3	3	-	-	-	3	-	3	-	-	-	-	-	-	-
Louisiana.....	2	2	1	1	-	1	1	2	1	-	-	-	-	-	-
Maine.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Maryland.....	2	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Massachusetts.....	4	3	-	1	-	2	-	3	-	-	-	-	-	-	-
Michigan.....	8	7	-	2	-	5	-	7	-	-	-	-	-	-	-
Minnesota.....	5	5	1	1	-	4	-	5	1	-	-	-	-	-	-
Mississippi.....	2	2	-	-	-	2	-	2	-	-	-	-	-	-	-
Missouri.....	9	8	1	2	-	6	1	7	1	-	-	-	-	-	-
Montana.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Nebraska.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Nevada.....	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-
New Hampshire.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
New Jersey.....	7	6	1	1	-	5	1	6	1	-	-	-	-	-	-
New Mexico.....	1	1	-	1	-	1	-	1	-	-	-	-	-	-	-
New York.....	14	13	1	4	1	8	-	12	1	-	-	-	-	-	-
North Carolina.....	4	3	1	1	-	2	1	2	1	-	-	-	-	-	-
North Dakota.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Ohio.....	6	6	1	1	-	5	-	6	1	-	-	-	-	-	-
Oklahoma.....	3	3	-	1	-	2	-	3	-	-	-	-	-	-	-
Oregon.....	4	3	-	1	-	3	-	3	-	-	-	-	-	-	-
Pennsylvania.....	10	10	-	1	-	9	-	10	-	-	-	-	-	-	-
Rhode Island.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South Carolina.....	2	2	-	-	-	2	-	2	-	-	-	-	-	-	-
South Dakota.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Tennessee.....	2	1	1	-	-	1	-	1	1	-	-	-	-	-	-
Texas.....	10	9	1	5	-	4	1	8	1	-	-	-	-	-	-
Utah.....	2	2	-	1	-	1	-	2	-	-	-	-	-	-	-
Vermont.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Virginia.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Washington.....	6	6	1	1	-	5	-	6	1	-	-	-	-	-	-
West Virginia.....	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-
Wisconsin.....	5	4	1	1	-	3	1	4	1	-	-	-	-	-	-
Wyoming.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 24. Number of health technologists and technicians, n.e.c., by State, place of residence, race, Hispanic origin, and sex: United States, 1980

(Figures in this table may not add to totals because of rounding to nearest hundred)

State	Total			Place of residence				Race and Hispanic origin							
				Urban		Rural		White		Black		Other		Hispanic	
	Both sexes	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total	1,525	559	967	256	411	302	556	443	763	62	139	24	27	29	38
Alabama	23	8	15	3	6	5	9	7	10	1	4	-	-	-	-
Alaska	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Arizona	23	9	13	7	11	3	2	7	11	-	-	1	-	1	1
Arkansas	14	6	8	1	2	5	5	5	7	1	1	-	-	-	-
California	165	71	94	45	55	25	39	49	67	7	9	6	8	9	10
Colorado	19	7	13	4	8	3	5	6	11	-	1	-	-	-	1
Connecticut	24	9	15	4	7	5	9	8	12	1	2	-	-	-	-
Delaware	4	1	3	-	1	1	2	1	2	-	1	-	-	-	-
District of Columbia	8	3	5	3	5	-	-	-	1	2	4	-	-	-	-
Florida	70	22	48	8	17	14	31	17	36	3	7	-	1	2	4
Georgia	35	13	22	2	4	11	17	11	15	2	6	-	-	-	-
Hawaii	6	2	3	1	2	1	2	1	1	-	-	1	2	-	-
Idaho	6	2	4	-	-	1	3	2	4	-	-	-	-	-	-
Illinois	68	23	46	11	20	12	26	17	34	4	8	1	3	-	1
Indiana	44	15	29	6	10	9	19	13	26	1	3	-	-	-	1
Iowa	21	6	15	2	6	3	9	5	14	-	-	-	-	-	-
Kansas	14	5	9	2	4	3	6	4	9	-	-	-	-	-	-
Kentucky	24	10	14	2	4	8	10	9	11	1	2	-	-	-	-
Louisiana	27	10	17	6	10	4	7	7	12	2	5	-	-	1	1
Maine	8	3	5	-	1	2	5	2	5	-	-	-	-	-	-
Maryland	42	18	23	6	7	13	16	12	15	4	7	1	1	1	-
Massachusetts	55	22	33	11	16	11	17	20	31	1	2	1	-	-	-
Michigan	59	21	39	11	17	10	21	18	31	2	7	1	-	-	-
Minnesota	32	10	21	6	7	5	14	10	21	-	-	-	-	-	-
Mississippi	14	5	9	1	2	4	7	4	7	1	3	-	-	-	-
Missouri	38	13	25	5	9	8	16	11	20	2	5	-	-	-	-
Montana	5	1	4	-	-	1	3	1	3	-	-	-	-	-	-
Nebraska	9	2	6	1	3	1	4	2	6	-	-	-	-	-	-
Nevada	5	2	2	1	1	1	1	2	2	-	-	-	-	-	-
New Hampshire	8	3	4	-	1	3	3	3	4	-	-	-	-	-	-
New Jersey	43	15	28	4	7	11	20	11	19	2	6	1	1	1	2
New Mexico	8	4	4	2	2	2	3	2	2	-	-	-	1	1	1
New York	110	42	68	25	35	17	33	31	50	7	13	2	1	2	4
North Carolina	43	18	25	5	7	13	18	13	21	4	4	1	-	-	-
North Dakota	3	1	2	-	-	1	2	1	2	-	-	-	-	-	-
Ohio	64	21	42	9	17	12	25	19	35	2	6	1	-	-	1
Oklahoma	20	7	13	3	5	4	8	6	11	-	1	-	1	-	-
Oregon	16	6	10	2	4	4	6	6	9	-	-	-	-	-	-
Pennsylvania	69	23	46	9	18	13	28	19	39	3	6	1	1	-	-
Rhode Island	7	3	5	2	3	1	2	3	4	-	-	-	-	-	-
South Carolina	22	7	15	1	2	6	13	6	11	1	3	-	-	-	-
South Dakota	3	1	2	-	-	1	2	1	2	-	-	-	-	-	-
Tennessee	41	16	25	8	12	9	13	14	19	2	5	-	-	-	-
Texas	89	31	58	19	37	12	22	21	39	3	11	1	2	6	8
Utah	8	5	4	3	2	2	2	4	4	-	-	-	-	-	-
Vermont	4	2	2	-	-	2	2	2	2	-	-	-	-	-	-
Virginia	31	11	20	4	6	7	13	10	16	1	3	-	1	-	-
Washington	24	8	16	4	7	5	9	7	14	-	-	-	1	-	-
West Virginia	13	5	8	-	1	5	7	5	8	-	-	-	-	-	-
Wisconsin	34	10	24	5	10	4	15	9	22	-	2	1	-	-	-
Wyoming	2	1	1	-	-	1	1	1	1	-	-	-	-	-	-

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

n.e.c. = not elsewhere classified.

Table 25. Number of health aides, except nursing, by State, place of residence, race, Hispanic origin, and sex: United States, 1980

[Figures in this table may not add to totals because of rounding to nearest hundred]

State	Total			Place of residence				Race and Hispanic origin							
				Urban		Rural		White		Black		Other		Hispanic	
	Both sexes	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total	2,920	454	2,467	230	982	224	1,485	299	1,854	99	424	19	51	37	138
Alabama	40	6	34	2	12	4	22	4	20	2	13	-	-	-	-
Alaska	3	1	2	-	1	1	1	-	1	-	-	-	1	-	-
Arizona	26	4	21	3	14	2	8	3	16	-	-	1	1	1	3
Arkansas	22	3	19	1	4	2	15	2	15	1	4	-	-	-	-
California	309	52	257	35	152	17	106	30	176	6	22	7	18	8	42
Colorado	30	5	25	4	13	1	13	4	18	1	2	-	1	-	4
Connecticut	44	7	37	4	16	3	21	5	29	1	6	-	-	1	2
Delaware	7	1	6	-	1	1	5	1	3	-	2	-	-	-	-
District of Columbia	11	3	8	3	8	-	-	-	1	3	6	-	-	-	-
Florida	119	17	102	6	32	11	70	10	66	4	26	-	1	2	10
Georgia	55	7	48	2	10	5	38	5	31	2	16	-	-	-	-
Hawaii	8	1	7	1	2	1	4	-	2	-	-	1	4	-	1
Idaho	7	1	6	-	1	1	5	1	5	-	-	-	-	-	-
Illinois	126	20	106	11	39	9	68	13	81	5	19	1	2	1	4
Indiana	71	8	62	4	21	4	42	6	53	2	9	-	-	-	1
Iowa	40	5	36	2	11	3	25	4	34	-	1	-	-	-	1
Kansas	31	3	28	2	8	2	20	3	25	-	1	-	-	-	1
Kentucky	43	6	37	2	9	4	28	5	33	1	3	-	-	-	-
Louisiana	31	4	27	2	12	2	15	2	14	2	12	-	-	-	1
Maine	17	2	15	1	1	2	14	2	14	-	-	-	-	-	-
Maryland	70	14	55	5	20	9	36	8	32	6	22	-	1	1	1
Massachusetts	91	15	76	9	34	6	42	12	68	2	5	-	1	1	2
Michigan	179	18	161	9	70	9	92	12	128	5	29	1	2	-	2
Minnesota	68	9	59	5	18	4	41	8	57	-	-	1	1	-	1
Mississippi	18	3	16	-	2	2	14	2	9	1	6	-	-	-	-
Missouri	68	11	57	4	20	6	37	8	47	2	9	-	-	-	1
Montana	6	1	5	-	1	-	5	1	5	-	-	-	-	-	-
Nebraska	17	2	14	1	5	1	9	2	13	-	1	-	-	-	-
Nevada	6	1	5	-	2	-	3	1	4	-	1	-	-	-	-
New Hampshire	11	2	8	-	1	2	7	2	8	-	-	-	-	-	-
New Jersey	106	14	92	5	25	9	67	8	67	4	18	1	1	1	6
New Mexico	13	3	10	1	3	2	7	1	5	-	-	1	2	1	4
New York	302	66	236	41	116	25	121	33	157	21	57	1	2	11	20
North Carolina	54	10	44	3	10	7	34	7	31	3	12	-	-	-	-
North Dakota	11	1	10	-	1	1	9	1	10	-	-	-	-	-	-
Ohio	156	21	135	11	55	10	80	14	109	6	24	-	1	-	2
Oklahoma	37	4	33	2	13	2	20	3	28	1	3	-	2	-	-
Oregon	23	3	20	1	5	2	16	3	20	-	-	-	-	-	-
Pennsylvania	167	24	143	10	47	14	97	19	119	5	21	-	1	-	2
Rhode Island	16	3	14	1	6	2	8	3	13	-	-	-	-	-	-
South Carolina	22	4	18	1	3	4	16	3	10	1	8	-	-	-	-
South Dakota	11	2	9	-	2	1	8	1	9	-	-	-	1	-	-
Tennessee	54	11	43	6	19	5	24	7	31	4	11	-	-	-	-
Texas	145	23	122	15	75	8	48	13	67	5	30	-	2	5	23
Utah	10	3	8	1	3	2	5	2	7	-	-	-	-	-	-
Vermont	5	1	4	-	-	1	4	1	4	-	-	-	-	-	-
Virginia	57	11	46	4	18	7	28	7	29	3	16	-	1	-	-
Washington	52	7	45	3	16	3	29	6	40	-	1	1	2	-	1
West Virginia	19	3	16	-	1	3	15	3	15	1	1	-	-	-	-
Wisconsin	84	9	75	5	29	4	46	8	69	1	5	-	1	-	1
Wyoming	3	1	2	-	-	1	2	1	2	-	-	-	-	-	-

NOTE: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

Table 26. Number of therapists, n.e.c., by State, place of residence, race, Hispanic origin, and sex: United States, 1980

[Figures in this table may not add to totals because of rounding to nearest hundred]

State	Total			Place of residence				Race and Hispanic origin							
	Both sexes	Male		Urban		Rural		White		Black		Other		Hispanic	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total.....	431	138	293	61	123	77	170	107	250	21	30	4	6	6	8
Alabama.....	5	2	2	1	1	1	1	2	2	-	1	-	-	-	-
Alaska.....	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-
Arizona.....	6	2	3	1	3	1	1	2	3	-	-	-	-	-	-
Arkansas.....	2	-	1	-	-	-	1	-	1	-	-	-	-	-	-
California.....	43	14	29	9	18	5	11	10	24	1	2	1	1	2	1
Colorado.....	7	2	5	1	3	1	2	2	4	-	-	-	-	-	1
Connecticut.....	8	2	6	-	2	2	4	2	6	-	-	-	-	-	-
Delaware.....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
District of Columbia.....	2	1	1	1	1	-	-	-	1	1	-	-	-	-	-
Florida.....	15	5	11	1	3	3	7	4	9	1	1	-	-	-	1
Georgia.....	12	4	8	1	2	3	6	3	6	1	2	-	-	-	-
Hawaii.....	2	-	1	-	1	-	-	-	-	-	-	-	1	-	-
Idaho.....	4	1	3	-	-	1	3	1	3	-	-	-	-	-	-
Illinois.....	24	6	17	3	8	4	10	5	15	1	1	-	1	1	-
Indiana.....	9	2	7	1	3	2	4	2	6	-	1	-	-	-	-
Iowa.....	3	1	3	-	1	1	2	1	3	-	-	-	-	-	-
Kansas.....	6	2	5	1	2	1	3	1	4	-	-	-	-	-	-
Kentucky.....	4	1	2	-	1	1	2	1	2	-	-	-	-	-	-
Louisiana.....	6	2	4	1	2	1	2	1	3	1	1	-	-	-	-
Maine.....	1	1	1	-	-	1	1	1	1	-	-	-	-	-	-
Maryland.....	10	3	7	1	2	2	5	2	5	1	1	-	-	-	-
Massachusetts.....	16	5	10	3	4	3	6	5	10	-	-	-	-	-	-
Michigan.....	17	6	11	3	4	4	7	5	10	1	1	-	-	-	-
Minnesota.....	11	4	7	1	2	2	5	3	7	-	-	-	-	-	-
Mississippi.....	2	1	1	-	-	-	1	1	1	-	-	-	-	-	-
Missouri.....	7	2	5	1	2	1	4	1	5	-	1	-	-	-	-
Montana.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Nebraska.....	2	-	1	-	1	-	1	-	1	-	-	-	-	-	-
Nevada.....	1	1	1	-	-	-	-	1	1	-	-	-	-	-	-
New Hampshire.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
New Jersey.....	12	3	9	1	2	2	7	2	8	-	1	-	-	-	-
New Mexico.....	2	1	1	-	-	-	1	-	1	-	-	-	-	-	-
New York.....	58	20	38	10	20	10	18	14	29	5	7	1	1	1	2
North Carolina.....	9	3	6	1	1	2	4	3	5	1	1	-	-	-	-
North Dakota.....	2	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Ohio.....	19	5	14	2	6	3	8	4	12	1	2	-	-	-	-
Oklahoma.....	2	1	2	1	1	-	1	1	2	-	-	-	-	-	-
Oregon.....	4	2	2	1	1	1	2	2	2	-	-	-	-	-	-
Pennsylvania.....	25	9	16	3	6	6	10	7	14	1	2	-	-	-	-
Rhode Island.....	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-
South Carolina.....	5	2	3	-	-	2	3	2	3	-	-	-	-	-	-
South Dakota.....	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-
Tennessee.....	8	3	5	2	3	1	2	2	4	1	1	-	-	-	-
Texas.....	21	7	14	4	7	3	7	5	10	1	2	-	-	1	1
Utah.....	4	1	2	1	1	1	1	1	2	-	-	-	-	-	-
Vermont.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-
Virginia.....	9	3	7	1	3	1	4	2	6	-	1	-	-	-	-
Washington.....	7	2	5	1	2	1	3	2	4	-	-	-	-	-	-
West Virginia.....	2	1	1	-	-	1	1	-	1	-	-	-	-	-	-
Wisconsin.....	9	2	7	1	2	1	5	2	7	-	-	-	-	-	-
Wyoming.....	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-

NOTES: The U.S. Bureau of the Census developed data on race and ethnic origin by crossing 1 census variable on race with another on Spanish origin. In the race and ethnic transformation, only Spanish-origin persons indicating their race as white or a Spanish write-in entry were coded as Hispanic.

n.e.c. = not elsewhere classified.

Appendixes

Contents

I. Methodology and definitions employed in 1980 decennial census	45
Census data collection and processing	45
Census 5 percent microdata sample file	46
Definitions and explanations of selected census terms	46
II. American Institutes for Research comparisons of census and noncensus data	49
Professional inventories	49
Employment surveys	49
Subnational data sources	49
Documentation and analysis of data sources	49
III. Qualifications of the data	51
Occupation classification	51
Education screening	51
Respondent and coding errors	52
State distributions and demographic characteristics	52

Appendix I

Methodology and definitions employed in the 1980 decennial census

Census data collection and processing

Since 1950, the census has collected its decennial population data via written questionnaire. In 1980, for the first time, a mail out and mail back procedure was used to collect questionnaire data in 95 percent of the country. Households not returning questionnaires were followed up in person or, if followup was not successful, had occupancy status, number of persons, and characteristics of persons allocated by an imputation procedure discussed later in this appendix.

A sample of one out of every five households was provided a long-form questionnaire that contained questions on their occupations. (Occupational data were not collected for persons in the Armed Forces.)

Nearly all items on the 1980 census questionnaire were precoded and able to be optically scanned. Occupation and industry data were major exceptions, requiring the application of complex coding rules. These coding rules resulted in health care personnel being coded into 29 census occupation categories and 8 census industry categories. The 29 occupation categories included the 24 in this report, plus the following: Medicine and health manager, medical scientists, medical science teachers, health specialty teachers, and dental laboratory and medical appliance technicians. The eight industry categories were offices of physicians; offices of dentists; offices of chiropractors; offices of optometrists; offices of health practitioners, not elsewhere classified (n.e.c.); hospitals; nursing and personal care facilities; and health services, n.e.c.

The classification scheme used by the U.S. Bureau of the Census for occupation underwent substantial revisions between the 1970 and 1980 Decennial Censuses to bring it in line with the newly created Standard Occupational Classification (SOC) Manual published by the Department of Commerce, Office of Federal Statistical Policy and Standards. SOC was developed in 1977 and revised in 1980 (in anticipation of the 1980 Decennial Census) to better meet the needs of census data users.

For the health professions, the primary changes brought about by the 1980 revisions in census coding of occupation concern the classification of individual occupational groups into more aggregated groupings. Also, certain health professions, specifically therapists, have been analyzed in greater detail since the 1970 census, in keeping with the growth of these fields during the 1970's. New categories were established for "inhalation (respiratory) therapists," "occupational therapists," "physical therapists," and "speech therapists." The 1970 coding categories for health occupations that were no longer used in

1980, on the other hand, included "chiropractors," "health trainees," and "lay midwives."

A general classification decision of the 1980 census was to maintain separate coding categories for therapist-level personnel in each of the larger therapeutic occupations, and for technologists and technicians (combined) in each of the larger technical occupations. This left two residual categories for "therapists, n.e.c." and "health technologists and technicians, n.e.c.," as well as one for all personnel below the technician level, "health aides, except nursing."

Questionnaires were reviewed for omissions and certain inconsistencies in the field and in the central processing office in Jeffersonville, Indiana. Some data, nevertheless, were still missing or out of range after the questionnaires were optically scanned; these data were then supplied by imputation. Thus, if one or more population items were either missing or not consistent with other entries, this population information was imputed through an allocation technique. The process of allocation uses various characteristics of household members as a reference or guide to determine a value for the missing characteristic(s). As in previous censuses, the general procedure for changing unacceptable entries was to assign an entry to a person that was consistent with entries for other persons with similar characteristics. The frequency of missing data, and thus the imputation rate, varied as a function of the respondent's socioeconomic status. Because occupations were allocated based on similarity of general socioeconomic characteristics, the socioeconomic variation in response and imputation rate was reflected in different observed imputation rates for different occupations.

In general, imputation of occupation and industry were carried out by a "hot-deck" allocation method. A hot-deck is an ordered file of data from edited census households that starts with a predetermined set of values and is updated as new values are observed. A hot-deck is used because of the correlation which has been shown to exist between a unit and its nearest neighbors. Thus the 1980 census data on the economic questions such as industry, occupation, class of worker, work experience, and income were processed using an allocation system that assigned values to missing entries in these questions, as necessary, from a single respondent with similar socioeconomic characteristics.

All data items allocated by the hot-deck method carry allocation flags that identify their statuses. This is important for the analysis of person-level data because there are certain circumstances where all allocated data may introduce undesirable bias. While the allocation procedure was designed to yield appropriate

statistics for the overall distribution or for specific subpopulations (the strata used in the allocation process), allocated characteristics will not necessarily preserve a valid relationship with other observed variables for the same individual. Thus, if the rate of allocations for a group is large and a bias in the allocated values is evident, it may be necessary to exclude allocated data from the analysis.

Special edit checks and reviews were carried out on the coded data. Out-of-range codes were reassigned to the most probable valid codes. In addition, some minimal age, education, and income criteria screening was performed on occupations, where feasible, and some cases were accordingly reclassified. The age, education, and income screens that were applied to the health professions were the following:

- Persons classified as physicians who were under 50 years old, had less than 4 years of college, and earned less than \$15,000 per year were reclassified as physician assistants.
- Persons classified as dentists who were under 50 years old, had less than 3 years of college, and earned less than \$15,000 per year were reclassified as dental laboratory technicians.
- Persons classified as veterinarians who were under 50 years old, had less than 3 years of college, and earned less than \$15,000 were reclassified as caretakers of animals (except farm animals).
- Persons classified as registered nurses who were under 50 years old, had less than 11 years of education, and earned less than \$10,000 per year were reclassified as licensed practical nurses.
- Persons classified as pharmacists who were under 50 years old, had less than 12 years of education, and earned less than \$10,000 per year were reclassified as health aides, except nursing.

Census 5 percent microdata sample file

The analysis of the 1980 decennial health occupation data performed by American Institutes for Research used the 5-percent Public Use Microdata Sample A file. This is a self-weighted file containing person-level records including long-form (sample) data for 5 percent of the U.S. population. This sample was constructed using a stratified systematic selection procedure with probability proportional to a measure of size. In the sample selection procedure the sample units were first stratified into 102 strata within which there was an appreciable degree of homogeneity in the characteristics among the census sample households.

The sample selection procedures for constructing the microdata samples were applied on a State-by-State basis. For any particular State, the procedure to accomplish the sample selection consisted of creating a number of cells in the computer which corresponded to each of the defined strata. A random value was assigned to each cell, the full-sample file was passed, and the appropriate weight for each sampling unit (person) was cumulated into the cell corresponding to the appropriate strata for each unit (person). For the 5-percent microdata sample, when a unit (person) caused the cumulation to exceed 20, that

unit (person) was designated for the sample, and the value of the cell was reset.

Sampling error resulting from the cumulative sampling of, first, long-form respondents and then, 5 percent microdata sample cases is one of the factors affecting the accuracy of the health occupation data. While the sampling error of the full-sample (19 percent) occupation counts is somewhat less, this is offset by other inaccuracies that result from using the aggregated, unscreened occupation data, which are the only occupation data available to the public from the full-sample counts.

The standard error for totals calculated from the 5-percent microdata file can be approximated by the formula

$$SE(Y) = \sqrt{19Y\left(1 - \frac{Y}{N}\right)}$$

where Y = the estimated characteristics total

N = size of area as defined by the total count of persons, housing units, or families in the area

In addition, the standard error so calculated should be multiplied by an adjustment factor specific to the characteristic being totaled. For occupation and industry, the adjustment factor is 1.2, and this same adjustment factor applies for the other characteristics of interest for this report, including sex, race, and Hispanic origin.

While reinterview studies and other content validation efforts have been undertaken for all recent censuses, these efforts were relatively limited in 1980, and they did not address the reliability of occupational data. However, national counts for the experienced labor force of health professionals generated by the Public Use Microdata Sample A file were in close agreement with the full sample counts contained on the Equal Employment Opportunity Special File.

Definitions and explanations of selected census terms

The definitions and explanations given in this section are extracted from the following census report: *Detailed occupation and years of school completed by age, for the civilian labor force by sex, race, and Spanish origin, 1980.*¹

Reference week

The data on labor force status relate to the calendar week preceding the week in which the respondents completed their questionnaires or were interviewed by enumerators. The reference week is not the same for all respondents because not all persons were enumerated during the same week. Because Census Day was April 1, 1980, the reference week for many respondents was the last week of March 1980.

Labor force status

Civilian labor force—The civilian labor force consists of persons classified as employed or unemployed according to the

NOTE: A list of references follows the text.

following criteria:

- **Employed**—Employed persons include all civilians 16 years and over who were either (a) "at work," those who did any work at all during the reference week as paid employees or in their own business, profession, or farm, or who worked 15 hours or more as unpaid workers on a family farm or in a family business; or (b) "with a job but not at work," those who did not work during the reference week but had jobs or businesses from which they were temporarily absent due to illness, bad weather, industrial dispute, vacation, or other personal reasons. Excluded from the employed are persons whose only activity consisted of work around the house or volunteer work for religious, charitable, and similar organizations.
- **Unemployed**—Persons are classified as unemployed if they are civilians 16 years and over and (a) were neither "at work" nor "with a job but not at work" during the reference week, (b) were looking for work during the last 4 weeks, and (c) were available to accept a job. Also included as unemployed are persons who did not work at all during the reference week and were waiting to be called back to a job from which they had been laid off.
- **Unemployed, no civilian work experience since 1975**—Persons are classified as unemployed with no civilian work experience since 1975 if they reported themselves as unemployed at the time of the 1980 census and (a) their last job since 1975 was in the Armed Forces; (b) they last worked in 1974 or earlier; or (c) they reported that they had never worked.

Although the Equal Employment Opportunity Special File contains data for the entire civilian labor force, occupation data are shown only for the "recent-experienced" civilian labor force (defined as persons employed in 1980 or unemployed having civilian work experience between 1975–80).

Occupation

The data on occupation were obtained for the employed, the experienced unemployed, and persons 16 years of age and over with work experience but not currently in the labor force. For the last two categories, the occupation is the most recent job that a person held during the previous 5 years. For an employed person the information is about the job held during the reference week. Those who were employed at two or more jobs reported the job at which they worked the greatest number of hours during the reference week.

Classification system—The occupation statistics utilize the detailed classification system developed for the 1980 Census of Population. This classification consists of 503 specific occupation categories arranged into 6 summary and 13 major occupation groups. It is based on the 1980 SOC Manual published by the U.S. Department of Commerce, Office of Federal Statistical Policy and Standards.

Industry and class of worker

This report shows data on major industry and class of worker subcategories for selected health occupation groups. The information on industry and class of worker refers to the same job as

the respondent's occupation. The industry statistics are based on the 1980 census detailed classification system developed from the U.S. Standard Industrial Classification system. Definitions of the class of worker categories shown in this report are as follows:

- **Salaried employees**—Persons who work for a private employer or for any Federal, State, or local governmental unit for wages, salary, commission, tips, pay-in-kind, or at price rates; this category also includes persons who work as employees of their own incorporated business or trade.
- **Self-employed**—Those who work for profit or fees in their own unincorporated business, profession, or trade; who operate a farm; or who work without pay in a family business or farm.

Race

Definition—The concept of race as used by the U.S. Bureau of the Census reflects self-identification by respondents; it does not denote any clear-cut scientific definition of biological stock. The data, therefore, represent self-classification by people according to the race with which they identify.

For a person who could not provide a single response to the race question, the race of the person's mother was used; however, if a single response could not be provided for the person's mother, the first race reported by the person was used. This is a modification of the 1970 census procedure in which the race of the person's father was used.

The "White" category includes persons who indicated their race as white, as well as persons who did not classify themselves in one of the specific race categories listed on the questionnaire, but entered a response such as Canadian, German, Italian, Lebanese, or Polish. In the 1980 census, persons who did not classify themselves in one of the specific race categories but marked "Other" and wrote in entries such as Cuban, Puerto Rican, Mexican, or Dominican were included in the "Other" race category; in the 1970 census, most of these persons were included in the "White" category.

The "Black" category includes persons who indicated themselves to be of the black or Negro race, as well as persons who did not classify themselves in one of the specific race categories listed on the questionnaire, but reported entries such as Jamaican, Black Puerto Rican, West Indian, Haitian, or Nigerian.

The "American Indian and Alaskan Native" category includes persons who did not report themselves in one of the specific race categories but entered the name of an Indian tribe or reported such entries as Canadian Indian, French American Indian, or Spanish American Indian.

The "Asian and Pacific Islander" category includes persons who indicated their race as Chinese, Filipino, Japanese, Asian Indian, Korean, Vietnamese, Hawaiian, Samoan, or Guamanian, as well as persons who provided write-in entries of such Asian and Pacific Islander groups as Cambodian, Laotian, Pakistani, and Fiji Islander under the "Other" race category. Also, persons who did not classify themselves in one of the specific race categories but wrote in an entry indicating one of the nine specific categories listed above were classified accordingly. For example, entries of Nipponese and Japanese

American were classified as Japanese, entries of Taiwanese and Cantonese as Chinese, and so forth.

The "Race, n.e.c." category includes all persons not in the categories of white persons, black persons, American Indians, Alaskan Natives, and Asian and Pacific Islanders mentioned previously. Persons reporting in the "Other" race category and providing write-in entries such as Eurasian, cosmopolitan, interracial, or a Hispanic origin group (for example, Mexican, Cuban, or Puerto Rican) were included in "Race, n.e.c." During the coding operations each of the subgroups constituting "Race, n.e.c." as well as the write-in entries of Asian and Pacific Islander groups under the "Other" race category were identified separately.

If the race entry was missing on the questionnaire for a member of a household, an answer was assigned in the computer according to the reported entries of race of other household members using specific rules of precedence of household relationship. If race was not entered for anyone in the household (excluding paid employees), the race of a householder in a previously processed household was assigned.

Hispanic origin

Definition—Persons of Hispanic origin or descent are those who classified themselves in one of the specific Hispanic origin categories listed in question 7 on the questionnaire (Mexican, Puerto Rican, or Cuban) as well as those who indicated that they were of other Hispanic origin. Persons reporting "Other Spanish or Hispanic" origin are those whose origins are from Spain, the Spanish-speaking countries of Central or South America, or they are Spanish-origin persons identifying themselves generally as Spanish, Spanish American, Hispanic, Latino, and so forth. Origin or descent can be viewed as the ancestry, nationality group, lineage, or country in which the person or person's parents or ancestors were born before their arrival in the United States. Persons of Spanish origin may be of any race.

Persons of more than one type of Spanish origin and persons of both a Spanish and some other origin(s) who were in doubt as to how to report a specific origin were classified according to the origin of the person's mother. If a single origin was not provided for the person's mother, then the first origin reported by the person was recorded. If any household member failed to respond to the Hispanic origin question, a response was assigned by computer in the sample edit operation according to available related information such as ancestry and place of birth reported for the household member. If such information was not reported, origin was assigned from entries of other household members using specific rules of precedence of household relationship. If no origin was reported for any household member (excluding a paid employee), then an origin was assigned from another household with a householder of the same race.

Limitations of the Hispanic origin data—A preliminary evaluation study of the reporting in the 1980 census item on Hispanic origin indicated that there was misreporting in the Mexican origin category by white and black persons in certain areas. The study results showed evidence that the misreporting occurred in the South (excluding Texas), the Northeast (excluding the New York City area), and a few States in the North-Central Region. Also, results based on available data suggest that the impact of potential misreporting of Mexican origin in the 1980 census is severe in those portions of the above-mentioned regions where the Hispanic origin population is generally sparse. However, 1980 census data on the Mexican origin population, or total Hispanic origin population, at the national level, are not seriously affected by the reporting problem. For a more detailed discussion of the evaluation of the Hispanic origin item, see the 1980 Census of Population Supplementary Report, "Persons of Spanish origin by State, 1980," PC 80-S1-7.⁷

NOTE: A list of references follows the text.

Appendix II

American Institutes for Research comparisons of census and noncensus counts

The material in this appendix has been extracted from the final report of the American Institutes for Research (AIR)⁴ study funded by the Bureau of Health Professions.

Refined health occupation counts derived from the census were compared by AIR staff, wherever possible, with counts derived from noncensus sources. Comparisons were carried out both for national totals and for within-occupation distributions by State and personal, educational, and economic characteristics, as available. The extent of the comparisons that were feasible varied considerably depending on the availability of noncensus data sources and on the extent to which occupations had been categorized in comparable ways by the census and by other sources. Three major categories of noncensus data sources were used: Health professional association inventories, employment surveys, and subnational data sources.

Professional inventories

The largest set of data sources used by AIR consisted of inventories or sample surveys of persons associated with a given occupation by virtue of their licensing, registration, or certification; by virtue of their association with a professional organization; or by both. In most cases these inventories were compiled by professional associations, sometimes in cooperation with government agencies that provided supplemental funding for special data collection efforts. Some are kept current (for example, the masterfiles of physicians, dentists, and veterinarians), and others represented periodic survey efforts (for example, surveys of optometrists, registered nurses, and so forth).

The validity of the data from professional inventories as a basis for estimates of the total professional workforce varies considerably among professions. Unless special efforts are made to correct for these problems, inventory data can undercount individuals who do not affiliate with their professional associations or, if State licensure data are used, overcount individuals who are licensed in more than one State. These issues have been successfully addressed in the larger masterfiles and periodic surveys, but are particularly likely to be problematic in the allied health professions, which have had limited resources available for data collection. In addition, many of these inventories do not provide information on active work status so that employed professionals cannot be distinguished from those who are maintaining their credentials while temporarily or permanently out of the workforce.

Employment surveys

The second major category of external data sources used by AIR were surveys that rely on employers of health profes-

sionals to count the numbers of full-time and part-time positions filled by members of given health professions. Two major employer-based data sources stood out as particularly germane to this project. They are the American Hospital Association Annual Survey of Hospitals, 1980, and the most recent cycle of the Bureau of Labor Statistics Occupational Employment Statistics survey, which covered non-Federal hospital sector employment in 1980 and private non-hospital-sector health care settings in 1981. Both sources provide supply estimates for a wide range of health occupations, ranging from independent health practitioners through allied health professionals. Counts of health professionals generated by the military provide a third major source.

The most serious methodological problem in using these surveys to generate total national supply estimates is the fact that they count only salaried employees, not those who are paid under contract or by fee for service. (This problem is, of course, most serious when the independent health practitioner occupations are considered.) Other methodological problems include the probability of counting individuals who work part time for more than one employer twice and comparability questions that arise from some nonrestrictive occupational definitions used by these surveys.

Subnational data sources

The third category of data sources used by AIR were subnational data that enumerate license holders, practitioners, or salaried health professionals for some specified geographic region, usually a State. While these data may be weak in terms of their potential for generating national supply estimates, they do afford the opportunity to undertake more fine-grained comparisons of census data for specific geographic areas. Such analyses are desirable where inadequate national supply estimates exist or where editing criteria based on minimum educational attainment can be identified only for professionals in those States that have restrictive licensing or registration requirements.

Documentation and analysis of data sources

Because the methodological shortcomings of the data sources tended to vary in certain systematic ways across the three major categories, data sources from two or more of the categories were selected as primary sources whenever possible. This strategy enabled AIR to triangulate on the best estimates of the national supply of health professionals in each of the occupations examined.

For each profession, the best data sources were identified and carefully analyzed to determine the nature of the resulting

data and the potential sources of error bias in these data. For each source a Survey Information Form (SIF) was completed that contained information on the origin, content, and methodology of the survey. When a given source (for example, the Occupational Employment Statistics or American Hospital Association Survey of Hospitals) was relevant to more than one profession, a single SIF was prepared for that source incorporating data for all health personnel.

The primary purpose of the SIF's was to provide a summary of characteristics of the data source so as to facilitate comparison with other noncensus data sources and with the census. The SIF's constituted "error profiles" of the surveys and record systems they document in that they identify potential causes of error or bias. They were primarily working documents that were used to identify and document the best source(s) of 1980 data for each profession.

Findings concerning noncensus data sources for each occupation were further summarized in narrative form in documents titled "source summaries." These source summaries briefly reviewed the available noncensus data sources for a given profession; identified the best sources for comparison to the 1980 census; indicated the adjustments, if any, that need to be made to make these sources fully comparable to 1980 census data (for example, subtracting military personnel); and summarized the types of data, other than gross national counts, that can be used in fine-grained comparisons with census data.

The analytic comparison performed by AIR covered the following topics for each of the occupations:

- Classification of the occupation in the 1980 census.

- Screening criteria applied in the analysis, if any.
- Impact of the screening on the composition of the occupational category.
- Active population estimate (after screening) and comparison with noncensus population estimates.
- Demographic, educational, and employment characteristics of the occupation as estimated from the census.
- Comparisons of characteristics as reported by census and noncensus sources.
- Summary of findings.

In reviewing AIR's occupation-specific findings, it should be noted that there is considerable variation among occupations in the extent to which the census succeeded in classifying health professionals unambiguously and by criteria accepted by the profession. In large part, this is because the census relies almost exclusively on job title (and industry) in classifying occupations, while job titles are less important than certifications and licenses for discriminating among many health professions. Another source of variation is the quality and quantity of noncensus data that were suitable for comparison with the census. For some occupations, such as registered nurses, extensive comparisons were possible, and the noncensus data were of high quality. For other professions, particularly in the allied health occupations, available noncensus sources were not in good agreement or only covered certain sectors (for example, hospital personnel) within the occupation.

Appendix III

Qualifications of the data

The detailed information in the body of this report presented information about the reliability of the census data for selected health occupations. This information was abstracted from a study conducted by the American Institutes for Research under contract to the Bureau of Health Professions. The purpose of this appendix is to summarize the general findings of the American Institutes for Research (AIR) analyses regarding the problems associated with the decennial census health occupation data.

Occupation classification

When using the census health occupation data, it must be noted that the 1980 census classification of health professionals relied almost exclusively on job titles and job descriptions (along with industry) to classify respondents into occupations. However, distinctions among health professions in the working world frequently are determined by licenses or certifications held, as well as on finely graded levels of skill and training that are not uniformly reflected in job titles. The census provided no record of specific certificates, diplomas or degrees held, nor of licenses. Consequently, there is necessarily some margin of error matching census classifications of health occupations to other classifications based on credentials. This problem is minimal for independent practitioners (for example, physicians and dentists) where there is a close correspondence between titles and licenses, but is greatest among the allied health occupations. Because of the historical development of these emerging professions, and probably also due to the essential nature of health care service delivery, there is considerable overlap between the job functions of different classes of providers and auxiliaries. While these occupations have largely established registration or certification procedures that entail the successful completion of designated educational prerequisites, members of the various registered or certified professions frequently overlap in the job market with one another and with job holders who have no special formal preparation.

Another classification problem concerns the distinction which the 1980 census (as well as prior censuses) made between the functional roles of teachers, managers, scientists, and clinicians. This distinction resulted in an unknown number of health professionals who were faculty being classified as "medical science teachers" instead of, for example, "physicians" or "registered nurses." Those who were involved in teaching, research, and administration were aggregated by the census

into functional categories, such as "managers, medicine and health," "medical science teachers," and "health specialties teachers." As a result, it is not possible to separate the individual health professions in these categories from each other.

The AIR analyses further reveal that the proportion of teachers, researchers, and administrators within a given profession that were classified as nonclinical personnel varied among professions. This variation was largely the result of how respondents described themselves on their census questionnaires; that is, whether they placed emphasis on their professional titles or on their functional roles. This problem is most severe among the independent practitioners and registered nurses, while only a few of the allied health professions are affected. This is because many faculty in allied health training programs are members of the other more highly trained health occupations.

Education screening

Because educational prerequisites, as well as specific examinations, licenses, and certifications, are major factors in differentiating levels of health professionals, such information is critical to properly classify persons by occupation. The 1980 census collected relatively little information on education and made only limited use of the education data it did collect when coding occupation.

The only 1980 census items that are directly relevant to the respondent's professional qualifications are the questions on the highest grade attended and completed. No questions were asked on the content of the education, so that one could distinguish an M.D. from a Ph.D., or a B.A.-level health professional from any other college graduate. A further complication is the fact that the years of education reported may or may not be related to the individual's training as a health professional. In addition, no data were collected by the census on vocational education received outside of a college setting. Yet, a record of noncollegiate as well as collegiate professional training is essential for identifying persons meeting minimum professional standards in a number of health occupations, such as nursing and the allied health occupations.

A related education screening issue concerns whether the 1980 census succeeded in restricting respondents classified into the primary independent practitioner categories to people who actually were in these professions. As a result of the minimum education screening criteria applied to these professions by AIR, the following proportions of cases were rejected from each of

the independent practitioner coding categories:

<i>Occupation</i>	<i>Percent failing screening criteria</i>
Physicians	7.0
Dentists	7.2
Optometrists	14.4
Pharmacists	18.2
Podiatrists	10.6
Veterinarians	10.7

Analyses of these cases indicated that they included persons of lower education. These persons also had lower incomes and were often female or minority. Therefore, the AIR analyses conclude that the most plausible explanation is that support personnel were coded into these independent practitioner categories.

Within the allied health field, the combination of technologist and technician titles into single coding categories could create some analytical problems because these titles generally represent at least two different levels of personnel with credentials. Therefore, there is usually interest in separate estimates for them. A related concern is that these categories may inadvertently contain personnel at the aide or assistant level as well. The AIR comparisons of census estimates and other non-census sources, however, while suggesting that some of the census allied health occupation categories may be inflated for this reason, do not indicate a general pattern of overinclusion. Because only a few of the allied health occupations have firm educational requirements that can be used as screening criteria, a criterion of 4 or more years of college was applied by AIR to four of these occupations with the following results:

<i>Occupation</i>	<i>Percent failing screening criteria</i>
Occupational therapists	19.8
Physical therapists	28.7
Speech therapists	5.3
Dietitians	46.3

Thus, as was also the case with the independent practitioner professions, the application of a minimum education criterion, where this was possible, resulted in a substantial reduction and restructuring of the occupational category. This occurred despite the fact that census occupation-allocated cases had been excluded prior to the AIR screening analysis. According to the AIR analyses, estimates based on these unadjusted occupational counts will misrepresent the health professions by including cases with insufficient education credentials. This will raise the proportion that are female and minority, have lower than median income, and, of course, a lower level of education. Whether a similar tendency to upward bias occurred in the estimates for those occupations that could not be screened for minimum education criteria cannot be determined, as neither

educational criteria nor noncensus comparisons were available to reliably distinguish the extent of upward bias in most occupational categories.

Respondent and coding errors

As a census questionnaire was completed per household, any family member could be the potential respondent for all the others in the household. Thus, the reporting of occupation was not necessarily provided by the job holder. In addition, the complex format of the questionnaire, in which questions pertinent to a given family member are spread across several pages and interspersed with questions on other family members and household characteristics, may have led to respondent errors in which the industry and occupation of one family member were incorrectly joined with the education and demographic characteristics of another.

In addition, because the census coders were not able to return to respondents to clarify ambiguous responses, some coding errors were inevitable. Further, coders could not possibly familiarize themselves with the nuances of all the hundreds of different occupations they coded, nuances that might make a difference in coding responses that were less than complete. Thus, for instance, if a respondent failed to provide a job title, but indicated that he or she sold and fitted eyeglasses in a retail eye wear outlet, a coder might not be able to reliably distinguish between an optometrist, an optician, or an optical shop assistant.

State distributions and demographic characteristics

When using the State tables contained in this report, which were run from the Special Equal Employment Opportunity files, the following points must be noted. With the exception of nursing personnel, these health occupations are, by and large, small occupations. For example, physicians and licensed practical nurses range from 400,000–500,000 persons; clinical lab personnel number about 250,000; dental assistants about 165,000; pharmacists 125,000; and dentists 118,000. The rest of the occupations are even smaller, with podiatrists and physician assistants numbering less than 10,000.

In the body of this report State distributions from the Equal Employment Opportunity and Public Use Microdata Sample A (PUMSA) files are compared for various independent practitioners with data from noncensus sources. While the level of agreement was within the 95-percent confidence interval of the census estimates for virtually every State, it must be remembered that most States only accounted for 1 or 2 percent of practitioners. Thus, the standard errors of the census estimates are rather large for all except the occupations with the largest numbers of personnel. For example, for optometrists, who number just under 22,000, the standard error of a proportion of 1.0 percent is 0.35 percent. This means that the 95-percent confidence interval ranges from about 0.3 to 1.7 percent. For most of the State distributions, the sampling errors in the 5-percent census PUMSA file render the 95-percent confidence intervals too wide for the data to be of much practical value.

The existence of the person-level PUMSA files also make possible special analyses focusing on the demographic charac-

teristics within specific health occupations. However, with a 5-percent sample, an error is substantially compounded when one attempts to focus analyses on subgroups that account for only 1-2 percent of the total population. Practitioner populations for most States and for most ethnic minority groups are of this proportional magnitude, and for several of the professions one sex or the other is also proportionally very small.

In addition to the sampling error, the census reports having random error in excess of 1 percent for many items. Furthermore, the biases that are suspected to have occurred as the result of uncorrectable occupational misclassifications disproportionately affect some of the subpopulations of greatest interest. For example, if Hispanic persons appear to account for

1.6 percent of an occupation, but actually account for only 1.0 percent, with the other 0.6 percent attributable to misclassified respondents (or miscoded white respondents), then the sample of Hispanic persons within that occupation would have over one-third spurious cases. Obviously this could lead to some strikingly incorrect conclusions.

On the other hand, a few variables, like geographic location, are not likely to be affected by misclassification bias. These data are probably also less subject to random error because census questionnaires were processed in geographic blocks. Consequently, sampling error is likely to be the only impediment to geographic subanalyses, and the magnitude of this error is a simple function of the size of the occupation.



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